JUNE 15, 1918

WHOLE SERIES, VOL. XLIII. No. 6. THIRD SERIES, VOL. XXXIV.

JUN 19 1918
UNIV. OF MICH.
LIBRARY

The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

Edited by

H. A. Hare, M.D.

Professor of Therapeutics and Diagnosis in the Jefferson Medical College,

GENERAL THERAPEUTICS,

and

Edward Martin, M.D.

Professor of Surgery in the University of Pennsylvania,

SURGICAL AND GENITO-URINARY THERAPEUTICS.

EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year, ...	Two Dollars.
Canada, one year, ...	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year, . . .	Ten Shillings.

E. G. SWIFT, Publisher, - - - DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

LONDON, ENGLAND—19 & 20 Great Pulteney St., W. SYDNEY, N. S. W., AUSTRALIA—125 York St.
WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—118 St. Paul St., W.
BOMBAY, INDIA—70 Hornby Road.

Entered at the Post-Office at Detroit, Mich., as second-class mail matter.

COPYRIGHT, 1918, BY E. G. SWIFT.

An Effective Remedy *for*
Nervous Sleepless Patients

NEURONIDIA

Palatable **Well-Tolerated** **Reliable**

Allaying Restlessness and Producing Refreshing Sleep.

Especially indicated in insomnia from mental strain, neurasthenia and other neuroses; also an excellent sedative in sea-sickness.

Literature on Request

Schieffelin & Co.
NEW YORK

Important Therapeutic Indications in Diseases of the Urinary Tract

Fulfilled by

URIFORM

Highly recommended in the treatment of

CHRONIC URETHRITIS **VESICAL CATARRH**

PROSTATITIS **VESICULITIS**

PYELITIS

BECAUSE:

It sterilizes the Urine
Arrests Discharge
Reduces Congestion
Allays Pain

DOSE: One to two teaspoonfuls three times daily.

Literature and Sample on request.

Schieffelin & Co.
New York

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Issued on the 15th of each month.

E. G. SWIFT, *Publisher.* HARRY SKILLMAN, *Business Manager.*

DETROIT, MICHIGAN, U. S. A.

CONTENTS, JUNE, 1918.

ORIGINAL COMMUNICATIONS.

Spinal Puncture as a Method of Treatment for Sciatica. By Major I. A. Allen, M.R.C., U. S. A., and First Lieut. Robert E. Parrish, M.C., U. S. A. 381
The Treatment of Gunshot Wounds with Ichthyol and Glycerin. By Charles W. Duggan, M.B., C.M. 382
Practical Hydrotherapy. By J. W. Torbett, M.D. 387
The Medical Treatment of Graves' Disease. By Hermon C. Gordinier, A.M., M.D. 390

EDITORIAL.

The Present Position of Artificial Pneumothorax in Pulmonary Tuberculosis 397
Vaccines, and Intraspinal Injections in Syphilis 398
Pulsus Alternans and Digitalis 401
Adrenalin-Pituitrin in Asthma 402
Thermotherapy in Gonorrhea 402
Cotton-process Ether 403

REPORTS ON THERAPEUTIC PROGRESS.

The Treatment of Hookworm Infection 396
How to Administer Quinine 405
Conservation of Food by Physicians 406
Prophylaxis in Cerebrospinal Syphilis 407
Studies on Infant Feeding with Reference to Calcium 407
The Intraperitoneal Injection of Saline Solution 408
Hemorrhage Following Removal of the Tonsils 410
The Question of Salicyluric Acid in Salicyl Urines 411
The Treatment of Neurasthenia and Psychasthenia Following Shell Shock 411
Report on the Treatment of Myelogenous Leukemia with Radium 412
Experiments on the Therapeutics of Amebic Dysentery 413
The Disinfection of Pneumococcus Carriers 414
Care of the Ears 415
Observations on Cases of Pneumonia in Relation to Types of Pneumococci and the Serum Treatment of Type I Cases 416
Adequate Treatment for Syphilis 416
Dacryocystitis 418
The Limit of Recovery in Hemiplegia 419
The Treatment of Eczema in Childhood 420
The Management of the Cardiopathic Child 420
Indigestion 421
Treatment of Whooping-cough by Vaccines 423
Nitrous Oxide and Oxygen in Obstetrics 424
Entamœba Histolytica Infection 425
The Administration of Large Doses of Quinine and Adrenalin by Hypodermoclysis in the Treatment of Malaria in Troops 426
The Administration of Bromide 427
Therapeutic Experiments with Rosenow's Antipoliomyelitic Serum 427
The Treatment of Eclampsia 428
Heart Failure and Pregnancy 429
The Effects of Tobacco on Cigar Workers 430
Pneumonia 430
Treatment of Entamœba Histolytica "Carriers" with Emetine Bismuth Iodide, with a Comparison between the Keratin-coated Tablets and Salol-coated Pills 432
Pregnancy and Pulmonary Tuberculosis 432
Abortion 433
The Treatment of Fractures in Warfare 435
The Surgical Significance of Abdominal Pain in Children 437
Skin-flap Transplantation as a Radical Measure to Cure Lung Abscess and Empyema Abscess 438
The Selection of Donors by Grouping for Blood Transfusion 438
The Prevention of Secondary Hemorrhage 439
War Wounds of the Knee-joint 439
Fifth Analysis of Cases of Tetanus Treated in Home Military Hospitals 440
Immediate Intervention in Wounds of the Heart 441
Ether Therapy in Surgical Infections and its Effect on Immunity 441
Tonsils a Cause of and Tonsillectomy a Cure for "Rheumatism" 442
Treatment of Gonococcal Arthritis by Sensitized Vaccines 442
An Address on the Orthopedic Outlook in Military Surgery 442
Vaginal Discharge in Children 445
Malignant Tumors of the Testicle 446
Facts and Fancies in Disinfection 446
Pyrogenic Therapy 447
Back Troubles 447
Treatment of Fracture of the Extremities by Means of Suspension and Traction 449

REVIEWS 453

EDITED BY

H. A. HARE, M.D., GENERAL THERAPEUTICS.

EDWARD MARTIN, M.D., SURGICAL AND GENITO-URINARY THERAPEUTICS.

EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Sts., PHILADELPHIA, PA.

Editorial communications should be addressed to the Editors, N. W. Cor. 18th and Spruce Streets, Philadelphia, Pa. Articles intended for the Original Department will be accepted only with the understanding that they are contributed to this journal exclusively. Authors will receive reprints in pamphlet form, without charge, providing the request for them is written on the margin of the articles submitted.

SUBSCRIPTION RATES:

United States and Mexico, one year, - - - $2 00 | Canada, one year, - - - - - - - - $2 50

Foreign Countries (postage paid), one year, 10/-

Foreign subscriptions may be forwarded through

THE THERAPEUTIC GAZETTE, 19 and 20 Great Pulteney Street, W., London, Eng.

MR. H. K. LEWIS (Medical Publisher and Bookseller), Agent, 136 Gower Street, London, W. C.

THE THERAPEUTIC GAZETTE, 125 York Street, Sydney, N. S. W.

THE THERAPEUTIC GAZETTE, Walkerville, Ontario, Canada.

THE THERAPEUTIC GAZETTE, 378 St. Paul Street, Montreal, Canada.

Address all business communications to

The Therapeutic Gazette,

743-747 Atwater Street, East, (P. O. Box 484) DETROIT, MICH., U. S. A.

For Mother and Child

After prolonged lactation a mother's milk usually decreases in quantity and nourishment. It is then that a properly prepared liquid extract of malt and hops would not only increase the volume of breast milk but the amount of its fat content. But to accomplish this, it must be a **real** extract of malt and hops and not a cheap imitation.

ANHEUSER-BUSCH'S
Malt-Nutrine
TRADE-MARK.

is the recognized standard of medicinal malt preparations and is prescribed by eminent physicians for the mother and child at the nursing period. It is made of the choicest barley-malt and Saazer hops and contains all the soluble substances of these two materials.

Pronounced by the U. S. Internal Revenue Department a
PURE MALT PRODUCT
and not an alcoholic beverage.

ANHEUSER-BUSCH, St. Louis

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE.

Whole Series. Vol. XLII. | DETROIT, MICH., JUNE 15, 1918. | Third Series. Vol. XXXIV, No. 6.

ORIGINAL COMMUNICATIONS.

SPINAL PUNCTURE AS A METHOD OF TREATMENT FOR SCIATICA.

BY MAJOR I. A. ALLEN, M.R.C., U. S. A.,

AND

FIRST LIEUT. ROBERT E. PARRISH, M.C., U. S. A.

As a matter of interest and information, and also in the hope of calling before the profession a method of treatment for sciatica not mentioned in the ordinary textbooks, it is the desire to report three cases of sciatica treated by means of spinal puncture. As is well known, many remedies have been used with varying results, and, we may say, most have failed to give the desired results in the treatment of this condition.

It cannot be claimed that the method of treatment mentioned above is specific, but after getting such phenomenal results from it in three cases in succession, it certainly impresses us as as being worth trying; the relief obtained being positive and followed immediately after puncture in each case.

It may be stated in the beginning that it was a matter of chance that brought the matter before our attention. The first case was done for diagnostic purposes, no one thinking that any relief from the sciatica would result therefrom, and it may be said further that it scarcely occurred to us that this would be worth trying again. There happened to be another case in the wards, and this time, not for diagnostic purposes, but in the hope of again relieving the patient, it was decided to perform another lumbar puncture. The second case turned out as well as the first; and then the third case, which again was a success.

Of the three cases treated as mentioned above, two of them were uncomplicated cases of sciatica, using the term "sciatica" to mean the condition manifested by very severe pain which began about the sacral notch and ran down the leg with, at times, a sudden shooting character, and so severe that the patients had to go to bed and could only sleep with the aid of drugs, the legs being drawn up and at times the muscles cramped. The third case had the same symptoms of sciatica, but added to this case was a condition which produced a swelling of one of the shoulders, which was considered to have no connection whatsoever with the sciatica.

The question of pressure of the cerebrospinal fluid might have something to do with the condition, as from the flow of fluid from the needle the pressure was distinctly increased in two cases, and in the third case we are unable to say that it was not decreased, because of the fact that the needle might have been near the dura or otherwise somewhat obstructed, which would have prevented the proper flow of the fluid. This seems insufficient to explain the fact that in all three cases the symptoms were unilateral.

The only explanation that could be derived in all three cases mentioned as to the predisposing cause of the condition was exposure to cold and dampness, a history of this being present in every case.

Case 1.—Officer, aged fifty. Robust individual, always well except for carbuncle on neck six months previously. Never had any

symptoms of sciatica before. About twenty-four hours after exposure developed pain in left leg and consequently was confined to quarters on November 1, 1917. On November 27 he continued to get worse and was admitted to the hospital. Pain very severe, radiating down the leg posteriorly. At the beginning the salicylates were given with apparently no beneficial results. Patient did not have any fever. Scarcely able to turn in bed. Unable to sleep properly. Pain very severe and continuous. Urinalysis did not show any sugar or albumin; specific gravity 1.019. On December 10, 1917, spinal puncture performed for diagnostic purposes; 30 Cc. fluid removed, which was negative to all laboratory tests, Wassermann, etc. The fluid seemed to be under some increased pressure (about 80 drops per minute). Immediately after the puncture the pain disappeared, but the patient was kept in bed, having been entirely relieved until December 18, when he went home for a short leave of absence. There has been no recurrence, two months having elapsed since the puncture was made.

Case 2.—Private, aged twenty, always in good health. Robust individual. No history of venereal disease. After exposure developed marked pain in right leg and was admitted to hospital on January 12, 1918, at which time there was marked pain and tenderness in posterior position of leg, from the hip down. Unable to extend the leg or flex it on the abdomen. Temperature 99°. No pain in left leg. Spinal puncture made on January 24, 1918, at 11 A.M. Patient completely relieved at once. Got up at 4 P.M., walked around the hospital, and went to duty next morning. Thirty cubic centimeters of clear fluid was removed, which was apparently under some increased pressure (about 90 drops per minute). No recurrence of pain since puncture.

Case 3.—Sergeant, aged thirty-one. Robust individual, always in good health. History of alcoholism at times. No history of previous attacks of sciatica. After exposure developed pain in left leg posteriorly, and radiating downward. Admitted to hospital on January 24, 1918. Pain so severe that patient could not turn in bed. Temperature never above 99°. On January 31, 1918, 25 Cc. clear fluid was removed by spinal puncture at 11 A.M. Pain at once relieved. Next day patient got up and walked around the hospital, down two flights of stairs and up one. This patient was not discharged at once on account of some swelling of the left shoulder, which condition apparently had no connection with the sciatica. No recurrence of sciatica to date.

THE TREATMENT OF GUNSHOT WOUNDS WITH ICHTHYOL AND GLYCERIN.

BY CHARLES W. DUGGAN, M.B., C.M.,
Major (retired) Royal Army Medical Corps, Military Hospital, Lincoln, England.

Two principles govern the treatment of gunshot wounds, viz., antisepsis and osmosis. The former is of greater importance in the early and the latter in the later stages of healing.

Provided that necrosed bone, bullets, pieces of clothing, etc., have been removed, abscess cavities opened to their full extent and counter-openings made where sinuses are present, when this is practicable, suppuration occupies a very limited period of time in the healing of a large gunshot wound. One of the much-lauded watery antiseptics will in a comparatively short period check suppuration, leaving however the granulations in a water-logged condition, to obviate which recourse is had to astringents, or a change of antiseptic, and eventually, after a long delay, healing occurs. The advocates of watery antiseptics very wisely omit all reference to the later stage of the healing process. Now this delay in healing is of very considerable importance from the patient's point of view and also on account of the difficulty of providing adequate hospital accommoda-

tion, which is likely to become acute as the war goes on. It is in this connection that I so strongly urge the use of glycerin, as by its application to the surface of a wound the resulting osmosis places the wound in a much more favorable condition for healing. Unfortunately there is no substitute for glycerin. I tried liquid paraffin in 1916, but found it formed a fine precipitate with ichthyol and was not osmotic in action. However, now that a cheap method of manufacturing glycerin has been discovered in America I am in hopes that a sufficient quantity will be available for this treatment, which I first advocated nearly three years ago.

I have selected ichthyol as the most satisfactory antiseptic on account of the wonderful action it possesses in relieving the congestion of the surrounding skin which is present in the great majority of gunshot wounds, and also for its sedative action on the wound. Pure ichthyol cleared up a case of ulceration of leg when other means failed.

I use equal parts of ichthyol and glycerin as long as there is suppuration, and provided the conditions I have already enumerated have been fulfilled this may be reckoned as three days; I then reduce the strength of ichthyol to 20 per cent. The combination is painted on the surface of the wound and the surrounding skin by means of a camel's-hair brush and then covered with antiseptic gauze, absorbent cotton-wool, and a bandage applied; on no account should an impermeable dressing such as oiled silk be placed over the wound as it invariably causes a delay in healing. When the dressing is changed on the following day I avoid washing the surface of the wound with lotion; I dry the surface with a sterilized swab of cotton-wool, and occasionally dab the wound with pure spiritus vini rectificati. I have discarded drainage-tubes as unnecessary and causing much suffering; they do not drain a wound satisfactorily, and in some situations are so compressed by the surrounding tissues, such as the anterior annular ligament of the wrist-joint (referred to in one of my cases), that there is complete blocking of the lumen of the tube. These remarks with reference to drainage-tubes I may here state are intended to apply only to the treatment of gunshot wounds, but I hope they will in time be justified in other cases. I may also add that I have never had occasion to regret having removed one or more drainage-tubes from any case transferred to my hospital, a proceeding which I have invariably carried out on the occasion of the first dressing. As a substitute for drainage-tubes I syringe out cavities and sinuses with pure spiritus vini rectificati as well as painting the cavity with ichthyol and glycerin. If the sinus is of some length and the intermediate portion at all superficial I make a counter-opening, deep sinuses healing up satisfactorily if, as I have already mentioned in regard to suppuration, foreign bodies have been removed. A few patients have complained of irritation from the spirit, and in these cases I have added methylene blue in the strength of four grains to the ounce of spirit; the result has been good.

Ichthyol naturally stains the surrounding skin, but it is not necessary to remove it at the time of dressing; in a few days this portion of skin separates, leaving a clean surface.

I am not in favor of removing adherent damaged tissue. I do not recommend suturing of gunshot wounds at any period, as I believe this treatment does away with the necessity.

All my patients have invariably volunteered the statement that this treatment suited their wounds better than anything that had previously been applied at the front or in this country.

The advantages I claim for this combination are:

1. There is no risk of extension of sepsis and secondary hemorrhage.
2. Septic absorption is checked.
3. The dressing does not adhere to the surface of the wound.
4. It does not irritate the wound.
5. Frequent changing of the dressing is not necessary; when the wound is very

septic it should be dressed twice in twenty-four hours, once in other cases. The dressing never requires to be changed during the night, and in consequence the patient's rest is no longer disturbed; hence the strain on the nursing service is greatly lessened and there is considerable saving in cotton-wool, lint, and bandages.

6. The time in hospital is very greatly curtailed as compared with other methods.

I will now briefly allude to a few cases received early in the war; they illustrate the value of this treatment better than more recent ones which showed less sepsis:

(1) No. 1601, Private R. T. B., 5th Battalion King's Liverpool Regiment, was wounded at Festubert on May 16, 1915, at 2 A.M. He lay in the open till 10 P.M., when he was dressed. He was admitted to the Fourth Northern General Hospital, Lincoln, on May 19, where the wounds were dressed twice daily with Wright's saline solution. On admission to the Military Hospital, Lincoln, on the 29th of May, 1915, there were three separate abdominal wounds extending from the upper part of the epigastrium to the pubes. They did not involve the muscle, and all were septic and suppurating freely. The upper wound measured 1 by ½ inch, the middle 4 by 2 inches, and the lower, which was circular, 5 inches across. The wounds were dressed once daily with equal parts of ichthyol and glycerin, and on the fourth day the ichthyol was reduced to 20 per cent. There was no suppuration after the third day. The upper wound healed on June 5, the middle one on June 28, and the lower on July 10, without skin-grafting. The wounds were occasionally touched with pure spiritus vini rectificati.

(2) No. 17687, Private B. H. F., 1st Battalion Suffolk Regiment; a somewhat similar case. Gunshot wound of left thigh on May 5, 1915, at Ypres. He had been under treatment at the Fourth Northern General Hospital, Lincoln, for three weeks with Wright's saline solution and hot boric fomentations changed three to six times in twenty-four hours. On admission the wound, which was suppurating freely, involved the upper and outer part of the left thigh; it measured 5½ by 5 inches, and the muscle was exposed. The same treatment was applied once daily. There was no suppuration after the third day. The wound had completely healed by the 14th of July, without recourse to skin-grafting. The discontinuance of frequent dressing of the wound was much appreciated by the patient.

(3) No. 7678, Private J. S., 1st Battalion, Stafford Regiment. Gunshot wound of back and neck. He was wounded on May 16, 1915. A piece of shell casing was removed at Boulogne. He was transferred to the Fourth Northern General Hospital on May 26. Wound dressed with hot boric fomentations changed thrice in the twenty-four hours.

On admission to the Military Hospital, Lincoln, three days later there were two wounds in the back of the neck about four inches apart; they communicated and had a drainage-tube extending from one wound to the other. The back of the neck was very much swollen and the wound was suppurating freely. The drainage-tube was removed on the second day and was not replaced. The sinus was syringed out once daily with pure spiritus vini rectificati and equal parts of ichthyol and glycerin applied daily. Sinus and wounds had healed completely on the twelfth day.

(4) No. 915, Sergeant F. H. J., 3d Battalion, South Lancashire Regiment, was wounded near Hill 60 in the right suprascapular region with a piece of shell on the 9th of May, 1915; this was removed on May 11 at Boulogne. On the fourteenth day a large incision was made in the back of the right upper arm. He was transferred to the Fourth Northern General Hospital on the 16th of May, where three incisions were made in the forearm on the 20th of May. The wounds were dressed with hot boric fomentations three times in the twenty-four hours.

When admitted nine days later all wounds were septic and suppurating freely. The arm was very much swollen and exceedingly tender. His general con-

dition was extremely bad. The various sinuses were syringed out with spirit and equal parts of ichthyol and glycerin applied once daily. On the 19th of June another incision five inches long above and behind the elbow-joint was necessary for a fresh collection of pus, this making the sixth operation wound. The sinuses closed up rapidly, the swelling of the arm subsided, and all wounds had healed on the 12th of July. I have no doubt that this treatment saved the arm from amputation.

(5) No. 8699, Private J. S., 3d Battalion, Royal Irish Rifles, was hit on the left internal malleolus by shrapnel on May 3, 1915, at Kemel. He was taken to Boulogne, where the wound was dressed with hot boric fomentations. He was transferred to the Fourth Northern General Hospital on the 8th of May, where three incisions were made in the calf and the wounds dressed thrice daily with hot boric fomentations.

When admitted on the 29th of May the leg was very much swollen and very tender. All the wounds were septic and suppurating freely. His general condition was extremely bad, as he was suffering from hectic fever due to septic absorption. The wounds were washed with spirit and dressed daily with equal parts of ichthyol and glycerin.

A fourth incision six inches long was made in the calf on the 10th of June to lay open a fresh collection of pus, and a fifth incision over the external malleolus. The patient's general condition improved rapidly, the wounds soon assumed a healthy granulating appearance, and the temperature fell to normal. The wounds had healed completely by the 12th of July. The lower end of the tibia remained somewhat thickened. Here again I claim that the limb was saved from amputation by this treatment.

The last case serves to show especially the osmotic action of the glycerin and incidentally the drawback to treatment with eusol:

A German petty officer had his left arm shattered in a naval engagement in the North Sea on the 25th of March, 1916, and the arm was removed on his own boat by means of a penknife about four inches below the shoulder. His boat was sunk, and he was rescued by a British torpedo boat, on which he remained for two days and was then brought to England. The flaps were trimmed and the wound was dressed every two hours during the day and every three hours at night with Wright's saline solution. After sixteen days he was transferred to the Fourth Northern General Hospital, Lincoln, where the wound was dressed daily with eusol for four days; then he was sent to the Military Hospital, Lincoln. The wound presented a healthy granulating appearance. A broad piece of strapping had been placed round the base of the flaps and another piece over their edges to keep them together. I removed the strapping at 10 A.M. and the flaps fell apart. I then painted the surface of the wound and the adjoining skin with 20-per-cent ichthyol in glycerin. At 7 P.M. I found the flaps adherent. In one week the wound became reduced to half its original size, and in another week it had completely healed over. The loose tissue of the flaps allowed full play to the osmotic action of the glycerin.

Treatment with eusol and Wright's saline solution had by this time largely monopolized the place of wet boric dressing, but as the latter is still to a great extent used for gunshot wounds it is worth while devoting some attention to this feeble watery antiseptic dressing. Wet boric appears to me an altogether illogical dressing. One has a weak antiseptic which has its action greatly handicapped by the presence of moist lint, this moisture favoring the growth of microörganisms in a septic wound, and as a result there is a continuous profuse suppuration which often lasts for an indefinite period. One patient with a small septic wound of the finger was treated for fourteen weeks with this dressing before healing occurred. Eventually I suppose the patient's leucocytes aided by the boric acid gain the upper hand. Frequent changing of the dressing is necessary, and this throws a great strain on the

hospital staff besides getting through a large stock of dressings, and the patient's prolonged stay in hospital constitutes a serious loss to the state, more especially in war-time.

A somewhat similar example is evident in the treatment of gunshot wounds by the immersion of the affected part for several hours each day in a medicated bath; the wound becomes edematous, loses its vitality, and does not heal. One of my patients who was hit in the left hand by a bullet from a Maxim had had his arm in a medicated bath for forty-eight hours, during which time he had not slept. When I saw him the hand was very much swollen, exceedingly painful, and suppurating freely. A change to ichthyol and glycerin dressing was quickly followed by a relief of all symptoms and rapid healing of the wounds.

From the first day this method is used the edges of the wound take on a healing action and begin to contract; this is evident on removing the discharge from the wound. Under the pus, which daily becomes thinner, healing of the edges is going on actively and in spite of suppuration.

As far as possible mud should be removed from wounds by means of vaselin applied on sterile swabs.

If my treatment is adopted in the American army on active service I am confident that many septic limbs will be saved from amputation.

As an addendum I will now give a list of other surgical conditions in which I recommend the use of ichthyol alone or in combination with glycerin. As my hospital has until recently been devoted entirely to cases of gunshot wounds, the number of these other cases has necessarily been limited, and in one or two instances I simply suggest lines of treatment. Under the circumstances I am satisfied to allow most of these suggestions to remain *sub judice,* but I wish to state my belief that a wide and valuable field of research is offered for further and more extensive investigation.

Burns.—When superficial the combination acts as a sedative and relieves congestion. If there is blistering of the surface it is better to cover the part lightly with lint and cotton-wool without bandaging. When the deeper structures are involved it has a wonderful effect on necrotic tissue. They should be dressed twice daily.

Whitlow and Boil.—After incision the daily application for a few days is sufficient to produce a complete cure.

Carbuncle.—Free incisions are necessary and all hemorrhage should be stopped before dressing. If the application has been made sufficiently early the carbuncle will have disappeared in a fortnight.

Vaccination.—If skin infection is present the whole of the affected area should be painted over.

Conjunctivitis. — Five- to ten-per-cent watery solution of ichthyol should be applied every two to three hours during the day to the inside of one or both lower lids, supplemented at night with a five to 10 per cent in vaselin when the lids are adherent in the morning. Ten-per-cent ichthyol in a case of gonorrheal ophthalmia caused a complete disappearance of the symptoms in a few days, leaving the eye unaffected. I have had equally good results with two and a half per cent in a case of ophthalmia neonatorum.

Gonorrhea.—A ten-per-cent watery solution of ichthyol as an injection gives very good results; it should be injected at least half a dozen times daily after micturition and retained for several minutes each time. There is less likelihood of a relapse and complications than with other drugs. It is still too expensive to use for irrigation.

Abscess.—Lay open and paint cavity.

It is equally good in ulcers and bed-sores before and after the skin has given way.

External Carcinoma.—After removal of the growth sutures should not be inserted; the wound should be painted daily with ichthyol and glycerin. In inoperable uterine carcinoma it is worth a trial.

Tropical Abscess of Liver.—After a free skin incision and resection of a portion of rib, if the abscess involves this portion of liver, inject abscess cavity daily with 5- to 10-per-cent ichthyol in glycerin; a drainage-tube should not be necessary.

Suppurative Appendicitis.—The combination should give a better scar than other dressings.

When it is necessary to amputate through suppurating tissue a few sutures should be inserted and this dressing applied.

REFERENCES.

Duggan: *R. A. M. C. Journal,* October, 1915.
Duggan: *The Practitioner,* January, 1916.
Duggan: *R. A. M. C. Journal,* March, 1916.
Duggan: *British Medical Journal,* 15th July, 1916.
Duggan: *British Medical Journal,* 11th Nov., 1916.
Daman: *British Medical Journal,* 11th Nov., 1916.
Alderson: *R. A. M. C. Journal,* December, 1916.
Duggan: *Journal of the Royal Naval Medical Service,* July, 1917.

PRACTICAL HYDROTHERAPY.

BY J. W. TORBETT, M.D., MARLIN, TEXAS.

Prof. J. J. Putnam, of Harvard University, says: "As regards the more chronic affections characterized by debility, anemia, and neurasthenic states, I can corroborate from my own experience the favorable statements made by others.

"I should now feel that I had not done justice to any but the slightest cases of these sorts, without prescribing baths of the best kind available."

Hydrotherapy has been used with benefit to suffering humanity since the days of Hippocrates, and yet I feel, notwithstanding its simplicity and efficiency, is not used nearly so much as it should be.

Since the recent greatly increased use of water as a beverage I feel that it may become more popular as an external remedial agent. I shall attempt to review briefly the principles of hydrotherapy and point out their practical applications as remedial agents to be used by the general practician in the homes of his patients.

In the first place the skin is the protective coating of the body, eliminating from 1½ to 2 pounds of perspiration per day, and much more when stimulated actively, which contains about one per cent of solids, consisting of urea, indol, phenol, sodium chloride, carbon dioxide, and fatty matter.

The skin absorbs oxygen, being in its full capacity an adjuvant to the lungs and kidneys. Microörganisms are also eliminated in the perspiration, several observers having found tubercle bacilli in the perspiration in at least 50 per cent of all cases with tuberculosis examined.

These functions with the radiating temperature regulating function, and perhaps others not yet known, are so important that grave symptoms of toxemia arise and death soon ensues when they are all suspended, more rapidly than from anuria, for Barker reports a case with both ureters blocked by stones so that no urine was secreted which lived ten days.

The character of the perspiration is changed in many diseases, and the urinous odor is readily detected in many cases of advanced nephritis.

The whole nervous system can be stimulated or depressed, and the function of many vital organs like the heart, kidneys, liver, bowels, and lungs, as well as nutrition and elimination, greatly influenced directly through the local action, and also reflexly by suitable application of water at different stated temperatures. A piece of rubber tubing not regularly used soon loses its elasticity. The human organs and tissues are much the same way. Rest and reaction, nutrition and elimination are the four great essentials of vitality and efficiency in normal cell life. Some continuous alteration of the normal function of one or more of these is always present in disease.

Inflammation with fever is characterized by increased cell activity due often to bacteria or their toxins which should be

antagonized or eliminated. The application of cold to inflammatory areas slows the process, lowers temperature, and diminishes pus formation, but if continued very long in one place may do great harm by antagonizing Nature's method of elimination through the skin and paralyzing the peripheral vasomotor and trophic nerves and their consequent powers of reaction.

The ice-bag so commonly used for that purpose, Dr. Simon Baruch says, should be covered always with flannel and never allowed in one place longer than fifteen minutes. Applied to the feeble and irregular heart it may have the effect of digitalis without its cumulative or toxic effect if removed often to allow reaction, according to Professor Winternitz.

It does not have a very great effect upon constitutional temperature because of its limited area, Winternitz claiming that at least one-quarter of the body's surface should be treated by the local application of water to influence the temperature.

The short application of cold is stimulating and tonic in effect. Chapman has found that ice, or the ice-bag, applied to the cervical or scapular region increases the circulation in the brain, and if applied to the lower lumbar and sacral regions relieves cold feet and increases the circulation of the extremities. Heat applied to the nape of the neck produces cerebral anemia and relieves active congestion. The alternate use of hot and cold is best in most cases, the heat relaxing the parts, easing pain, while cold stimulates and gives a more permanent tonic effect, increasing CO_2 elimination.

Winternitz and his assistants showed that the cold, thermic and mechanical procedures applied to the whole body gave an increase in the red and white corpuscles and also the hemoglobin. All hydriatic procedures for elimination, sedation, stimulation, or increased nutrition must have some reaction to be of permanent benefit. A definite reaction must always be secured in every case to obtain the desired results.

The temperature, duration and pressure of any given hydriatic procedure necessary to produce the desired reaction will vary in each case, as does the dose of strychnine or any other drug. The direct action of a certain hydriatic procedure is usually opposite to the reaction which must follow as its effect. As small doses of drugs usually have opposite effects to large doses, so do short hot or cold treatments have opposite effects to long treatments.

The dictum, *"similia similibus curantur,"* is decidedly true in hydrotherapy. Any disease whose symptoms are the same as those produced by long hot or cold treatments will be benefited by the use of short hot or cold treatments, and *vice versa*. The neutral zone of temperature in which no especial reaction is produced is 92° to 97°. Temperatures below this are tepid, cool, and cold in 10° to 12° for each division, while the same above 98° is called warm, hot, or very hot.

A cheap thermometer, a few towels, a rubber sheet or oilcloth, a fountain syringe, and some hot and cold water, all to be found in almost any patient's home, are potent agencies for the relief of pain and the cure of disease by stimulating nature to increased elimination, reaction, and better nutrition. A few brief procedures will now be outlined and their indications mentioned.

The ablution or sponge bath consists of the application of water to successive parts of the body by means of the hands or a wash-cloth or bath mitten, the temperature varying according to the objects in view. In any febrile condition the different parts of the body as far down as the knees are bathed every two or three hours, with the water gradually made cooler each time till 60° is reached, all cold applications being given with friction to assist and insure reaction. The patient is wrapped in a heavy blanket on the rubber sheet while this is being done. The rationale is found in the gentle shock and reactive stimulation so refreshing with increased capillary circulation, deeper respiration, and better heart action. The patient may stand in a tub of

water at 100°F. and be washed down in the same way, then dried off rapidly and replaced in bed. An affusion is given in the same way except the water is poured from a pitcher or bucket, from a considerable height, at a temperature of 80°, then 70°, and as low as 60° F. It is very useful in scarlet fever and other adynamic cases with feeble pulse, coma, etc. By this method Currie secured remarkable cures in typhus, using sea water while the patients were lying on deck.

The sheet bath is useful in all cases with high temperature to reduce it and to stimulate one's powers of resistance to toxins. A rubber sheet and thick blanket are placed on one side of the bed, a linen sheet dipped in water 60° to 70° F. is laid over this; then the patient, whose face has been bathed in ice water and a cold compress left on the head, is snugly wrapped up in it. As soon as one part of the body becomes warm it is cooled off again by cold water being poured on it, and followed by friction. An alcohol rub ends the treatment.

It is also useful in cases of hysteria, insomnia, and neurasthenia, often producing sleep, while the patient remains in it an hour or more. It is useful in gout, rheumatism, etc.

The hot blanket pack is used in the same way, except a second blanket instead of the sheet is wrung out of hot water at a temperature of 130° F. It is useful in securing increased elimination in gout, rheumatism, arteriosclerosis, nephritis, delirium tremens, and used also to restrain and calm the wild and insane patients.

Reaction should be secured occasionally by the cold mitten or alcohol rub. It should not be given in advanced cases of nephritis with weak hearts and threatened uremia because of the consequent depression.

The small electric light apparatus of two to four globes, 32 c. p. of Burdick or Betz, given under the cover, followed frequently by the cold mitten rub, is much better in such cases, the light being as beneficial as the heat, with the cold rub for its stimulating reaction. This light method with the drinking of much water is used very successfully in the City Hospital of St. Louis, for burns of more than one-third the body surface. It promotes diaphoresis and healing, coagulates the albuminous serum, and no dressings are required.

Hot fomentations are especially beneficial to relieve pain, cramps, and threatened suppuration, but should be alternated with the cold mitten rub in cases with fever. If the pain and temperature are increased suppuration is already present, and exploratory aspiration should be done to locate the pus, which should be evacuated at once. Hot fomentations over the abdomen with the drinking of much hot plain water, and a hot enema, is much better treatment for cramps due to acute indigestion, ptomaine poisoning, etc., than the usual injection of morphine, which binds up all the patient's emunctories, often for a day or two. Epsom salts sprinkled on the skin before the fomentation will assist in relieving the pain of local inflammation.

The cold compress, which consists of three or four layers of a linen towel, folded to fit the part, wrung out of ice or cold water, applied to the part inflamed and covered well with a larger dry towel, is very beneficial in cases of tonsillitis, croup, pneumonia, and insomnia, with intestinal indigestion and stasis. It can be worn all night if agreeable, or changed during the daytime every hour. The hot vaginal douche at 120° F. given for one hour is used in cases of acute gonorrheal salpingitis in the City Hospital of St. Louis.

There are many other hydriatic procedures which this short article cannot consider, but it is hoped these few brief suggestions may stimulate more interest in their more general study and employment.

There are excellent articles in Sajous' Analytic Cyclopedia, The Reference Hand Book, Musser and Kelly's Treatment, and Forchheimer's Therapeusis of Internal Diseases, while the larger works of Kellogg, Baruch, Deiffenbach and Pope are useful to those who wish complete authorities.

THE MEDICAL TREATMENT OF GRAVES' DISEASE.

BY HERMON C. GORDINIER, A.M., M.D., TROY, N. Y.

Because of the brilliant therapeutic effect of thyroid feeding in overcoming both the adult and infantile type of myxedema and allied states of thyroidal insufficiency, the medical profession naturally have waited for long in anticipation of some equally brilliant discovery for the alleviation and cure of Graves' disease or exophthalmic goitre and other border-line conditions of heightened excitability of the whole sympathetic nervous system, the result of an altered hyperthyroidal secretion. Thus far, however, despite much clinical observation and laboratory research, no such specific therapeutic agent has been forthcoming. It is the lack of such a special agent for the relief and cure of this disease that has caused so much distrust on the part of many physicians in regard to its medical treatment. It has developed in their minds an attitude of indifference or actual antipathy, and has created such a lack of interest or abstract carelessness toward the care and treatment of these unfortunate sufferers, that many of them have passed out of their hands into those of the charlatan, or thoroughly disheartened and discouraged, and broken in health, with extreme toxemia and cardiac insufficiency, they have sought as their last and only hope the relief that may possibly come from the knife of some daring surgeon, with results that too often reflect discredit on both surgery and medicine. As the late Dr. Musser tersely expressed it, "the surgeon is apt to do too much and the physician too little." That such pessimism exists is largely due to the conflicting statements, lack of method, and innumerable drugs, which have from time to time been recommended for the alleviation and cure of this affection.

We must remember, however, that this disease is so protean in its manifestations, so erratic and variable as to its course, subject to so many spontaneous remissions and exacerbations, and whose natural tendency is either to recovery or death from toxemia and cardiac failure, or rarely to retrogression with thyroidal wasting and hypoactivity with the production of myxedematous state, that it is difficult to correctly interpret the effects of medical treatment. Under similar conditions as to treatment, some cases rapidly improve, others remain stationary, while others fluctuate, steadily losing ground, and terminate fatally.

No greater nor more responsible duty confronts the general practitioner than to properly guide and treat the patient who suffers with Graves' disease. Each case should be thoroughly studied from every possible angle. He should be optimistic and at the same time inspire confidence, and in turn if possible exact absolute coöperation on the part of the patient. I know of no other condition where treatment is so dependent on individualization as it is in Graves' disease. Every effort should be made to recognize the disease early, and especially is this true of the early atypical forms in which many of the classic symptoms may be absent. He should be on the constant watch for the acute toxic cases which are so frequently passed unrecognized or are mistaken for some of the acute infectious diseases, such as typhoid fever, subacute endocarditis, acute toxic delirium, etc. Especially vigilant should he be to quickly recognize the acute toxic thyroid symptoms engrafted on the ordinary degenerative, cystic, or adenomatous type of goitre.

I want to emphasize the importance of making a careful search in every case of Graves' disease, typical or atypical, to discern whether a focal or systemic infection may be the primal causative factor exciting the thyroid to an active hypersecretion with the production of all the classical symptoms. It is interesting here to relate that Dr. W. G. Thompson, in reporting eighty cases of Graves' disease with acute thyroidal intoxication, states there were 20 cases with acute tonsillitis or quinsy, a ratio of

one to four, and ten other patients gave a history of repeated attacks of bronchitis, severe coughs and colds, la grippe and pneumonia. Cases with these minor infections were notably frequent among the febrile goitres, sixteen examples being noted in 43 cases. In many instances the tonsillitis either accompanied or shortly preceded the acute febrile toxic cases of Graves' disease. I have seen two typical cases of Graves' disease, each subject to repeated attacks of acute tonsillar infections, clinically cured after two years of observation with rest and the enucleation of the diseased tonsils.

Six years ago I saw in consultation a boy nine years of age, with acute thyroidal intoxication appearing during the course of a severe scarlet fever infection. He was extremely toxic, had a marked fine tremor of his extremities, a very rapid, feeble, but regular pulse at the rate of 160, and a temperature of 105°; he was delirious, had distinct exophthalmus, and an enlarged, soft, elastic, very vascular thyroid, over which was heard a continuous humming-top sound, and a soft systolic bruit. His condition seemed very grave. The use of the Beebe serum was considered, but because of the severe scarlet fever infection it was deemed unwise to administer it. However, with the intermittent local use of ice both to the thyroid gland and precordium, together with elimination and absolute rest, he gradually improved, and in the course of three months all manifestations of the hyperthyroidism had disappeared. Recently I saw his physician, who states that the boy has remained perfectly well and shows no exophthalmus, thyroid swelling, or tachycardia. This case seems definitely to prove that a general toxemia from an acute infection may excite acute pathologic changes in the thyroid gland with hypersecretion and the production of the Basedow symptom-complex.

It is because of the above mentioned cases and the numerous instances recorded in the literature where focal or general infections seem to be responsible for the initiation of grave toxic thyroidal states that I deem it very essential in every case of Graves' disease, typical or atypical, to locate and eradicate by surgical or medical means any type of local or general infections, such as pyorrhea, diseased tonsils and adenoids, sinus, middle-ear and mastoid infections, gonorrheal or other infectious arthritides, tubal disease, gall-bladder or appendicular infections, constipation, colonic stasis, etc. A number of cases of Graves' disease are recorded in which a complete cure has resulted from the relief of such infections. It is interesting here to note that J. W. Vaughan states that Dr. Morse was able to cultivate by the Rosenow method from the thyroid glands removed from two typical cases of Graves' disease the streptococcus viridans.

With these facts in mind it is necessary again to emphasize that one of the most essential points in the successful treatment of exophthalmic goitre is the removal of all sources of infection either focal or general.

The most rational therapeutic means at our command in the alleviation and cure of Graves' disease is rest both physical and mental, so as to secure tranquillity of the mind and perfect rest of the body, the type of enforced rest so long ago successfully instituted by the late Dr. S. Weir Mitchell in the treatment of neurasthenia and the group of mild psychoses. In addition thereto I would enjoin exposure to abundance of open fresh air and sunshine in a dry salubrious climate at a moderate elevation—such a type of rest cure as we are accustomed to advise our patients with early active tuberculosis; whether with such cure should be associated partial or strict isolation is largely dependent upon the social status of the patient, and the type and severity of the nervous and cardiac manifestations. One of the requisites in properly carrying out a strict rest and isolation cure is to have the coöperation of an intelligent, cheerful, and optimistic nurse, both resourceful and with good judgment, and one, if possible, who has had

considerable experience with nervous patients. It is remarkable what a calmative and soothing effect such a nurse may have in these cases. Whether the rest cure should be undertaken at home in the quietest room in the house and as far away from the family as possible, or at a well-conducted hospital or sanatorium, is a debatable question and should be decided on the merits of each case. Personally, while I have treated several cases successfully at home, I am convinced that in most instances the results obtained are much better in a hospital where every facility is at hand for properly carrying out the treatment. The time is not far distant when every hospital will have metabolic wards attached where the results of the rest cure, hygienic and other methods may be controlled by the study in each case of the basal metabolism.

The probable length of time the patient should rest can only be determined by the type of case, the severity of the toxemia, and the symptoms relating to the cardiovascular and nervous systems. The rest cure should not be too lightly or indifferently undertaken. It should be carried out in a most systematic manner, and it is my judgment that but few patients should be treated in an ambulatory fashion. In order to gain the confidence of the patient it is wise to acquaint him with all the facts of the case and to state explicitly, if possible, the probable length of time it may take to effect a cure, whether several weeks or months. One cannot too strongly emphasize the value of bed rest and other hygienic measures in the care of the early manifestations of this disease, for it is the consensus of opinion of internists that with this treatment most of the early cases are permanently cured, whereas without proper rest these cases may become progressively worse and often lapse into the most serious types of the disease. It is therefore our duty to make the same effort to recognize the early or incipient case of Graves' disease as it is to recognize a case of incipient tuberculosis. These border-line or early cases usually show vasomotor instability, slight or great nervous excitability, easily fatigued, slight or rapid weight loss and persistent tachycardia, with constant or occasional vascular excitability, throbbing of the large vessels and especially of the abdominal aorta, or moderate increase in size of the thyroid gland over which thrills are felt and vascular murmurs are usually heard, or the gland may not be visibly or palpably enlarged. The exophthalmus and associated ocular manifestations are often missed, while a delicate fine tremor of the upper extremities is a very early symptom. A definite, rather general falling out of the hair of the scalp is often observed very early in these cases, and is of considerable diagnostic value. These cases ofttimes have a slight elevation of temperature toward late afternoon or evening and are often subject to severe sweating. The detection of a capillary pulse or, with the ophthalmoscope, the discovery of pulsation of the retinal vessels may also be helpful in the diagnosis.

Riesman's sign, a soft systolic murmur heard over the eyeballs with the lids closed, is present in a goodly number of cases, but owing to the spastic condition of the eyelids and the resulting loud muscular sounds thus produced it is often overlooked.

Patchy or diffuse pigmentation of the skin, while it may occur early, is most often observed in the more chronic or advanced cases. This pigmentation may be so marked that it closely resembles that of Addison's disease; it is possible that it may have as its cause an associated suprarenal insufficiency.

Goetsch has showed that the percutaneous injection of a minim of 1-to-4000 solution of adrenalin chloride will in Graves' disease show a very prompt skin reaction, a large urticaria-like wheal. Such a reaction may also be present in extremely nervous individuals. The real diagnostic value of the test is its negativity. I have tried this test recently in ten cases at the Samaritan Hospital, both mild and severe, and have always found the reaction positive. A test said to be of a far greater diagnostic value is the subcutaneous injection of 7

minims of a 1-to-1000 solution of adrenalin chloride, when if hyperthyroidism is present all the symptoms are quickly exaggerated, and characteristic blood-pressure changes are induced. Löewi's adrenalin mydriasis test is an early diagnostic sign of value. A careful white-cell count is also of value as first pointed out by Kocher, showing in the early cases a leucopenia, with a diminution of the polymorphonuclears and a decided mononucleosis. The coagulability of the blood is nearly always somewhat delayed.

The best guide as to the length of the stay in bed is the stability of the nervous system and the condition of the pulse. If after rest the nervous system becomes calm and the pulse rhythmic, with a rate at or just above the normal and remains so with but slight fluctuations, the appetite good and the weight loss ceases, or there is an actual gain, she then may be permitted to rest for an hour or two on the sofa or in a comfortable chair, or if weather conditions permit out-of-doors in a hammock, and later be allowed to walk about the room, corridor, or veranda, short of being fatigued or suffering from palpitation. Stair-climbing should be interdicted for a long time, and especially is this true with cases showing myocardial insufficiency. It is unnecessary to go more into detail with regard to rest, both in the mild and severe cases of Graves' disease; its value is recognized alike by the internist, neurologist, and conservative surgeon.

It is interesting here to note that the statistical study of Hale White is strongly corroborative of the great value of rest in this disease, for he states from his study that fifty per cent of the cases were cured by medical means—that is, rest and other hygienic measures—and eighty per cent of these remained permanently cured.

McCarrison in his recent work on the thyroid gland states that with rest and medical means in 3523 cases so treated and recorded in the literature, recovery occurred in a little over 5 per cent; in nearly 38.5 per cent of cases the condition was alleviated or became chronic; while death resulted in 11.8 per cent.

MacKenzie's and Musser's statistics are equally corroborative.

DuBois has found working with the Sage calorimeter that the increase in metabolism is equaled in no other disease, and is strictly proportional to the severity of the clinical symptoms. With rest alone in cases observed at the Bellevue Hospital he found a fall in metabolism from 10 to 15 per cent, and he regards rest as one of the most important means to alleviate and cure this disease.

In conjunction with rest the question of feeding is of great importance in the treatment of Graves' disease. Considerable difference of opinion, however, exists as to the amount and kind of food necessary. Most sufferers with Graves' disease are thin, and curiously enough we rarely encounter one that is fat except in the young. The degree of emaciation is dependent upon the severity of the symptoms. In mild cases the loss of weight is usually but slight, whereas in the severe toxic cases, and particularly in those who suffer with severe periodic attacks of diarrhea, the emaciation is often extreme. The weight loss is due to the rapid oxidation of the body tissues from the increased metabolic activity, the result of the hyperthyroidal secretion, as is shown by the enormously increased gaseous exchange and nitrogen elimination. Our endeavor should be to repair the loss and increase the body weight by increasing the caloric value of the foodstuffs administered. It has been my custom to allow plenty of milk, cream, butter and all milk products, bread, toast, eggs, cereals, rice and other carbohydrates and fats, green vegetables and fruits, and, except in severe toxic cases, fish, chicken, lamb, and beef, in strict moderation, and pure soft water always in abundance to aid elimination; all stimulants, tobacco, tea, coffee and spices, pickles, and most acids should not be allowed.

DuBois' work with the calorimeter proves that the specific dynamic action of

proteins and carbohydrates in exophthalmic goitre patients is not appreciably different from the normal, and that there is no significant difference between the effect of meat and same amount of protein in milk and eggs. He states that the protein ratio in these cases should contain from about 12 to 15 grammes of nitrogen a day, which is the amount ordinarily consumed. Despite these experiments I believe animal protein should be given sparingly, and in the extremely toxic cases should for a time be absolutely stopped, for we know that in excess they produce an increased thyroidal secretion.

In connection with proper feeding it is necessary to emphasize the importance of perfect elimination through the bowels; a daily evacuation is very essential. This may be secured with proper diet and plenty of water, or it may be requisite to have recourse to laxative drugs, enemas, and colonic irrigation. An occasional blue pill or a dose of castor oil is ofttimes a very wise measure in those of constipated habit. I have found sodium phosphate given before breakfast a valuable means to correct the mild forms of constipation in this disease.

Medicinal treatment is uncertain in its results. Drugs that have done good in some cases have proved ineffectual in others. To attempt to enumerate the various drugs which have been recommended for the alleviation and cure of this affection would be a useless task. I have made use of many of them, and while perhaps benefit slight or great has come from some of them, it has always been questionable whether rest, proper feeding, and other hygienic measures were not alone responsible. I would, however, like to emphasize strongly the value of the neutral hydrobromide of quinine in conjunction with the rest in the treatment of this affection. The use of this drug was suggested by the late Dr. Forchheimer of Cincinnati. It has been my custom to use it in capsules of from 3 to 5 grains, three or four times daily, and to continue this dose until tinnitus occurs, and then reducing the amount just short of this physiological effect. The secret of success in its use is to continue it over a long period of time, months or years, with an occasional interruption only. When the symptoms are under control it is wise to decrease the dose to one or two capsules a day, or perhaps to give the same dose but once or twice a week. Usually within a few weeks one notices a lessening of most of the symptoms; especially is this true of the tachycardia, the nervous and vasomotor instability, and the tremor; the thyroid frequently becomes by actual measurement decreased in size; the exophthalmus, however, is the last symptom to disappear.

Forchheimer states that he has treated 71 cases with but 6 failures—*i.e.*, 82 per cent were cured.

Jackson and Mead of Boston found that of 56 cases treated at the Masschusetts General Hospital with this drug and under observation for three to nine years, 76 per cent had no signs of symptoms for two years, while 13 per cent had been benefited and only 11 per cent were failures. They suggest that the drug may calm the overstimulated sympathetic nervous system and thus put an end to its stimulation of the thyroid gland and the vicious circle thus created.

Huchard suggests that it acts as a tonic to the heart and that it has vasoconstrictor and vagus inhibitory effects. Phosphorus is another drug with which I have had considerable experience, and can speak strongly in favor of its use in the treatment of this disease, if administered in freshly prepared pills of from 1/100 to 1/25 of a grain, thrice daily, over a long period of time. It has had in my hands a salutary effect in the relief and cure of these cases, and especially those that develop in early adult life; it is quite remarkable what a tolerance for the drug these patients have. I have frequently given phosphorus with short periods of interruption for a year or two without the slightest unpleasant consequence. I have watched for four years

six typical cases of exophthalmic goitre treated with phosphorus, which at present have no signs of the disease. It is interesting in this connecton to note that Köcher lauds very highly large doses of sodium phosphate, given three or four times a day for the treatment of this disease. He believes that it acts as a direct antidote to the iodine-containing substance of the thyroid gland.

Although drugs of the digitalis group are constantly in use in an effort to reduce the cardiac rate, in my hands they have as constantly failed, and I have found them only of avail in the treatment of the cardiac insufficiencies and associated arrhythmias of the later stages of this disease. In the early stages of the disease, before myocardial insufficiency occurs, rest and the local intermittent application of cold both to the thyroid gland and precordium by means of the ice-bag or Leiter's coil has had the most tranquilizing effect in reducing the pulse-rate of any means that I have employed.

In my early practice I used at one time for this same purpose increasing doses of tincture strophanthus continued over a long period of time, and while in a few cases good results occurred, for the most part its effects were disappointing. For the nervous excitability and insomnia I have found the hydrobromide of quinine most useful and have rarely been obliged to use hypnotics or opiates. The occasional use of large doses of bromides at night is perfectly justifiable, but I want to deprecate their continuous use, and I would also add a word of warning about the use of opium or its alkaloids unless for some very special purpose. Validol, although now off the market, has worked very well in some cases to relieve the nervous erethism and induce sleep. A cleansing bath each morning followed by one or more cold ablutions, or a cold salt rub with gentle friction, are comforting, and ofttimes a warm bath at night will induce sleep. While the patient is undergoing the rest cure general gentle massage is of considerable value.

My experience with electricity in this disease, while limited to the application of galvanism to the cervical sympathetic and the use of faradism after the method of Vigoroux and Charcot, has shown no permanent improvement in the few cases in which it has been systematically employed. Some years ago while working in a large neurological clinic at Boston I had the opportunity of watching the effect of the static wave current on perhaps a dozen ambulatory cases of Basedow's disease, and although absolutely unbiased I could see no definite signs of improvement in any of them. It has seemed to me that electricity was valuable in this disease only from the standpoint of autosuggestion.

There seems to be no unanimity of opinion in regard to the value of the various glandular products or the specific sera in the treatment of Graves' disease. By some physicians they are highly extolled, whereas others regard them of no special value. In an experience extending over a number of years I have had occasion to use in a considerable number of cases the various ductless gland products as well as thyroidectin and thyreolytic serum of Beebe and Rogers, and while excellent results have occurred in a few cases, I have been impressed with the fact that perhaps rest and other hygienic measures may have been in large part responsible.

Hoppe because of the intimate relations between the function of the thyroid gland and ovaries, and assuming a hypoactivity of the ovaries in Graves' disease, has adminstered corpus luteum to about 20 cases of Graves' disease with most gratifying results.

I have had no personal experience with Roentgen therapy in this disease. Judging, however, from a study of the recent literature, experienced observers regard radiation as being a real therapeutic achievement in the treatment of Basedow's disease. They state that the pulse-rate is nearly always slowed, the tremor and nervous system improved from the start, the gland rapidly diminished in size in many cases, the throbbing and vascularity are greatly lessened, and the gland becomes much

softer in consistency. The body weight practically always increases. Falta in his work states that he has witnessed good results from radiation in several cases, in which there followed disappearance of the glycosuria, diarrhea, and tremor, and an increase in weight.

Schwartz, from the first medical clinic at Vienna, has reported 40 cases, in all of which after radiation the nervous symptoms have disappeared, and the tachycardia in all but a few cases. Two-thirds of his cases showed gain in weight, one-half of the cases showed regression of the exophthalmus, and in one-third of the cases the gland was decreased in size. Waters, of Hopkins, in 1915 reported 16 patients who received 18 treatments with 8 cures, 7 markedly improved, and only 1 failure.

Stoney reports 41 cases with 14 cured and 22 much improved.

Fischer reports 12 cases cured for over two years and 4 improved.

The advantages which this treatment possesses, according to Malcolm Seymour, may be summarized as follows: First, no fatalities; second, no resulting scars; third, no interference with the patient's occupation; fourth, it is painless and causes no inconvenience, and if unsuccessful an operation may be done with less risk because of the very favorable action of the rays on the associated enlargement of the thymus gland and the reduction of the vascularity of the thyroid. He states that the treatment should be undertaken only by those thoroughly experienced in Roentgen therapy. The dose should be most accurately measured. If used in a haphazard and unscientific manner, serious or total atrophy of the gland may result with the production of myxedema, such cases having been reported in the literature.

The following conclusions may be presented:

1. If recognized early most of the mild or incipient cases are curable by prolonged rest, hygienic and medical means.

2. Fifty per cent of the more advanced cases are curable by the same methods.

3. All cases that have undergone for a reasonable length of time careful medical treatment, and have shown no improvement or have progressed or present pressure symptoms, should be placed at once in the care of the experienced surgeon skilled in thyroid work.

4. Cases showing myocardial insufficiency or serious arrhythmias, as alternation, fibrillation, or flutter, should be treated medically.

5. X-ray pictures of the chest should be taken to discover extraneously placed, accessory or dipped thyroids, and to determine the size of thymus gland.

6. Success in treatment in each case depends on careful individualization.

7. The ideal treatment of Graves' disease is enforced therapeutic rest.

THE TREATMENT OF HOOKWORM INFECTION.

DARLING and HACKER in the *Journal of the American Medical Association* of February 23, 1918, in concluding an extensive paper on this topic say that it would appear from comparison that the half maximum dose (0.5 Cc. three times, or 1.5 Cc.) of oil of chenopodium is the treatment for recommendation as a routine vermicide.

It does not have the toxic effects of the full dose, and two treatments have the very satisfactory result of removing 99 per cent of all worms present.

It has the additional advantage of a more uniform action, a greater effect on anchylostomes, and of being less unpleasant to take than thymol.

Thymol shows an advantage over this half maximum dose of oil of chenopodium in that, without producing toxic effects, the 90-grain dosage produces a better result when single treatments are compared. This advantage disappears, however, when two half maximum treatments of oil of chenopodium are given. Smaller doses compare unfavorably with a single half maximum dose of oil of chenopodium. A dose as large as 90 grains of thymol, if administered indiscriminately throughout the population, would probably give rise to serious symptoms.

EDITORIAL.

THE PRESENT POSITION OF ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS.

From time to time we have discussed in these pages the facts which can be marshalled for and against this method of treating pulmonary tuberculosis. There can be no doubt that in certain cases, rather limited in number, it produces results which can be obtained in no other way, but, as in all other instances, this method of treatment is bounded by rather narrow limitations, and we are constantly learning more about the scope of its proper application. The fact that nature often delays or arrests the tuberculous process by producing a pleural effusion is an interesting confirmation of the view that artificial pneumothorax, by compressing the diseased lung, may induce good results. On the other hand, it seems to be universally admitted that the method is useless, or dangerous, if the lung is bound down by adhesions so that complete collapse cannot be induced, and it is also generally considered that the presence of lesions in the opposite lung is a contraindication to its employment: first, because of the increased labor which is thrown upon the uncompressed lung; and, second, because the increased labor which is a condition diametrically opposed to the rest induced by the pneumothorax, may hasten the tuberculous process while it is delayed by our therapeutic procedure. Feebleness of the heart or its displacement as a result of adhesions, particularly if the injection is to be made on the left side, are factors to be considered.

Those who are familiar with medical literature over a considerable number of years recognize that in the discussion of a given topic which is novel three or four stages are passed through. In the first stage marked enthusiasm as to the success of the suggested plan is breathed with every word; in the second stage it is noticed that the contributions are a little more moderate in their enthusiasm, either because some disappointment has been met with as to the cure, or some startling accident has caused the enthusiast to "stop, look, and listen;" after this papers appear which indicate that the treatment, whatever it may be, has definite limitations.

At this period it may be fairly concluded that a correct estimate of the value of the plan has been at least approximately reached. If the plan possesses little value it passes into the fourth stage in which papers are published which condemn it, or the plan slips into obsolescence with a death-like silence which is in strong contrast to the blare of enthusiasm which marked its advent. We think it may be fairly stated that the treatment of pulmonary tuberculosis by artificial pneumothorax has now reached the third stage, which we have described. This is illustrated in a safe and sane communication to the *Medical Record* by Williams. He emphasizes the point that we have already mentioned, namely, that the presence of disease in the opposite side may cause a rapid advance in that part, and we know only too well that in a very considerable proportion of cases the disease is bilateral, particularly if it is advanced to a stage when artificial pneumothorax seems indicated. Williams then proceeds to discuss the dangers of compression, calling attention to the so-called pleural reflex which sometimes induces very alarming symptoms, even death. Again he claims that pleural effusions are a common sequence occurring in not less than sixty per cent of cases. Occasionally there is a perforation of the lung, particularly if some adhesion is present, and this is followed by septic infection or pyopneumothorax, and pyothorax produced by the act of puncture may also occur, although this should be largely prevented by proper asepsis. If the needle enters the lung and punctures a blood-vessel air embolism may occur.

Forlanini has reported a case of miliary tuberculosis following compression, and

instances of tuberculous meningitis as a consequence are also recorded.

Last of all, dilatation of the right side of the heart because of the interference with the circulating of blood through the lungs may ensue. As Williams says, this seems a rather long list of reasons why we should be at least conservative in the use of artificial pneumothorax.

It is interesting in this connection to study the very widely separated views of those who have made reports upon this method. Williams says that they vary from 0 per cent to 100 per cent of successes. Some report improvement varying from 18 to 92 per cent. Particular attention should be paid to the statement that Baldwin and his coworkers at Saranac Lake claim 100 per cent effusions in their cases, because these men are noted for the care which they exercise in the investigation, study, and treatment of the cases which make up their statistics. Possibly this matter may be best summed up by quoting two of the closing paragraphs in Dr. Williams's communication:

"So far as artificial pneumothorax in the treatment of tuberculosis is concerned, I admit that I may seem to be rather pessimistic. I shall want a more uniform report of the results obtained, and better reasons for their having been obtained, than have yet been furnished. I do believe, however, that the operation is clearly indicated in cases of uncontrollable hemorrhage, where all other means have been exhausted and the life of the patient seems in imminent danger. Here the compression need not be kept up long enough to bring about many of its dangers. Here it is an emergency measure, and seems rational and justifiable.

"Many compressionists say that the operation is dangerous, requiring great skill and knowledge. I agree with them that it is dangerous; not, however, because of the necessity of an almost superhuman skill, but because of the direful results in such a large percentage of cases. Even by those to whom the greatest skill is attributed, many disappointments are admitted.

"A more or less extensive experience with the tuberculous, covering a period of about thirteen years, has brought my mind to the point where it dictates that early diagnosis, hygienic, dietetic, and medicinal treatment, and careful general management of the case, afford the safest and surest means of cure of pulmonary tuberculosis. I present this paper with the hope that it may assist in turning the pendulum on its backward swing, and that it may deter from the indiscriminate practice of compression that is followed by some to-day."

VACCINES, AND INTRASPINAL INJECTIONS IN SYPHILIS.

Fully recognizing the remarkable advances which have been made concerning the etiology, pathology, and treatment of disease in general, the practitioner now and then stands aghast when measures, which for a number of years have been considered beyond all doubt efficacious, are claimed by those of large experience to be worthless. It is inevitable that the human mind, in its great anxiety to discover means of relief for those who are sick, should seize with avidity propositions which seem to contain much promise. When these propositions are not based solely upon bedside observation but have their origin, and seeming confirmation, in laboratory investigation the general practitoner is perhaps all too prone to swallow hook, bait, and line. These remarks have their origin in a number of papers which have appeared from time to time in regard to the usefulness or uselessness of vaccine therapy, on the one hand, and of intraspinal injections in the treatment of cerebrospinal syphilis on the other.

From time to time we have printed in the Progress columns of the GAZETTE views advancing and denying the claims of vaccine therapy, but it has only been within the last two years that an array of evidence against vaccine therapy has been increasing to such an extent that those who are for it seem to be rapidly being put upon the defensive. It certainly is true that vaccine

therapy does not possess half the value which it was held to possess shortly after the investigations of Wright held out such brilliant promise. In general terms, even when an autogenous vaccine is employed, it may be said of it that it is to a large extent a hit-or-miss proposition, first, because when an autogenous vaccine is used it is not always derived or made up of the microörganism which is in reality the cause of the malady; second, because some patients are too ill to develop the resistance to the infection which the injection of vaccine is supposed to induce; and, third, because we have no way of measuring, within several hundred thousand microörganisms, the dose which a certain individual should receive.

Within the last two years we have published an editorial in which it would appear from the investigations of a number of men that much of the advantage which accrues from the use of vaccine therapy depends not upon any specific influence which a given vaccine may exercise, but chiefly, or solely, upon the effect on the body of the hypodermic injection of any foreign protein substance. It will be recalled that in this editorial cases were quoted of gonorrheal rheumatism, and other forms of arthritis, which did better upon the injection of dead typhoid bacilli than upon any other method of treatment, in some instances the improvement being so miraculous as to be almost beyond belief.

Space does not permit our quoting *in extenso* much of the literature upon this subject which has appeared since that time, but it is interesting to note that Miller, as the result of his own investigation and also as the result of a careful consideration of a large amount of recent literature dealing with a number of widely separated pathological conditions, throws additional light upon the value of vaccine therapy. He says that a search of the literature for beneficial results from vaccine therapy in colon bacillus infection, acute or chronic rheumatism, bacillary dysentery, whooping-cough, gonococcal infections, and dermatological conditions, such as acne and furunculosis, produces disappointment, and, furthermore, he asserts that a review of the literature of erysipelas reveals no striking evidence that vaccine administration has modified the course of any infection which was acute, and much less has it been shown that the results were due to the specific character of the vaccine.

At one time the phylacogens were looked upon with disfavor and condemned by some because they lacked specificity, but, if the conclusions of Miller and many others are correct, it would appear that these objections are worthless and that recent experience justifies the employment of the phylacogens, which rests upon quite as firm a foundation as does vaccine therapy in general, with the additional advantage that there is no opportunity, through error, of introducing living organisms into the body.

Concerning the use of non-specific foreign proteins, Miller says that he has treated in a period of eighteen months one hundred and seventy-five cases of acute, subacute, and chronic arthritis due to streptococcic or gonococcic infection. He used typhoid vaccine as the foreign protein, beginning with a dose of forty millions and increasing this amount until a decided reaction was obtained. Usually this reaction consisted in the onset, within a few minutes to an hour, of a chill, more or less severe, and a temperature as high as 104° or 105°, ofttimes less, and a leucopenia, followed by marked leucocytosis. Violent reaction in those who are feeble may be dangerous, as in alcoholic and nephritic cases, but in those in whom the reaction is not followed by disagreeable effects marked benefit often accrued in cases which had failed to respond to the salicylates, so that the results which Miller has obtained would seem to be better than those which have been arrived at by the employment of either stock or autogenous vaccines. This probably accounts in part for the excellent results which have been obtained by many physicians whose observations cannot be doubted when using the phylacogens in cases of this kind. Miller admits that the nature of the reaction has not been deter-

mined, and he is not ready to state that the plan which he has pursued should become a permanent therapeutic measure, although he believes that the results which he has obtained are so important that the method cannot be entirely disregarded. If some means can be devised by which a good result can be reached without a febrile reaction he believes that this plan of treating acute arthritis is superior to the salicylates or other means at present employed. In all probability, however, a febrile reaction is an inseparable condition from the other states which the injection of dead typhoid bacilli engenders. Indeed, it is possible that the sharp rise of temperature may in itself be part, if not all, of the curative process.

It is interesting to note that Thomas has also found that the injection of non-specific protein material produces curative results of a marked character in that pain was relieved, at least for a time, and that general benefit ensued, so that he considers that his patients have done much better than those previously treated by other methods, and he considers this method superior to others which he has used.

At the present time it would seem that the whole subject of vaccine therapy seems more clouded and uncertain than it did in the earliest stages of its development.

Because of the disappointing results which were obtained in the treatment of syphilis of the nervous system by the intravenous injection of salvarsan the profession was eager and willing to accept the proposition advanced chiefly by Swift and Ellis that the intraspinal injection of salvarsanized serum would produce excellent therapeutic results. Here, again, in our anxiety to benefit an otherwise hopeless class of patients, we were, perhaps, too willing to argue on the basis of *post hoc* and *proper hoc*, with the result that many thousands of injections have been given intraspinally, and very many papers have been published by competent observers which seemed to prove that this method has produced results when nothing else would. But, as time goes on, we are brought face to face with contradictory statements as to the value of intraspinal injections both in paresis and locomotor ataxia. In all probability those who have failed to obtain good results have said and written little, while those who have thought they observed improvement have said and written much, and so the evidence has not been fairly presented to the profession in general. Here, again, space does not permit us to discuss in detail a large amount of the literature. It suffices for our purpose to call attention to the article which we abstracted for our Progress columns by Sachs of New York. In this article he asserts, with great positiveness, that the intraspinal injection of salvarsanized serum is practically impotent, and intimates that all the good results which have seemed to accrue from its use have been due to natural variations in the progress of chronic lesions which have been known for years to have periods of remission or improvement. He admits that laboratory tests as to the globulin in the spinal fluid itself, cell content, and the Wassermann reaction may indicate that an improvement has taken place, but he regards the study of the patient's progress symptomatically as being of greater importance than laboratory findings. He believes that even when the latter are favorable the patient, nevertheless, progressively goes through the stages of his disease without any material benefit.

The conclusions of Sachs seem to be confirmed, so far as paresis is concerned, by the results of Evans and Thorne, of the New Jersey State Hospital for the Insane, who state that they subjected twenty-three patients to a series of intraspinal treatments with salvarsan, neosalvarsan, and albuminate of mercury, presumably meaning by this salvarsanized or mercurialized serum. The smallest number of injections given to one patient was three and the largest number twenty. The Wassermann was temporarily reduced to negative in the blood of one patient, and the cerebrospinal fluid in three patients. Three patients showed some mental and physical improvement, ten died

during the course of treatment, and six several months after the treatments were discontinued. Ten are living and are markedly demented. These observers, therefore, enunciate the view that the intraspinal method of treatment of paretic dementia has little or no value.

We think it will be eventually determined that intraspinal injections in the treatment of cerebrospinal syphilis are useful in direct proportion to the earliness of their employment, and we are inclined to believe, for this reason, that they should be resorted to in every case in which the cerebrospinal fluid gives a positive Wassermann, even if no symptoms of disorder of the nervous system are present. No remedy can be expected, as we have so often pointed out in these columns, to regenerate tissues which have been destroyed, or to remove exudates or inflammatory material which has become organized.

It is to be hoped that before long a sufficient number of observers may confirm or contradict Dr. Sachs, and those who hold the same opinions, so that the rest of us may reach safe and reliable conclusions in regard to a very important factor in the practice not only of specialists but of general practitioners as well.

At times we hear the scoffer express belief that his colleagues have an inordinate faith in drugs. These scoffers not infrequently urge that no faith be held except it have laboratory indorsement, but sometimes, as in the case of vaccine therapy and intraspinal injections, it would appear that, after all, clinical observations are as reliable as those which are thought to have a practical application as the result of laboratory study.

PULSUS ALTERNANS AND DIGITALIS.

In another issue of the THERAPEUTIC GAZETTE we have published an abstract of an article upon this subject written by Windle. Some years ago it was universally considered that pulsus alternans was an absolute indication of severe myocardial degeneration, and although this conception of its prognostic value has been to some extent modified, nevertheless it can be fairly stated that in the great majority of cases it is indicative of a severe degenerative change and betokens evil, the more so as no drug which we possess, or in all probability ever will possess, can be expected to regenerate fibers of the heart muscle which have undergone segmentation or other change degenerative in nature. Rarely the employment of doses of digitalis which are excessive has seemed to temporarily induce a pulsus alternans, but in many of the cases in which digitalis has been accused of this action it would seem probable that a true pulsus alternans has not been present and that the irregular systoles induced by overdoses of digitalis have been misinterpreted. On the other hand, there is some evidence, as, for example, that presented by Windle, that the use of digitalis in the presence of pulsus alternans may, at least for a time, dissipate this symptom by presumably improving the tone of the heart fibers which remain healthy so that they may perform their function with greater effect. Where a true pulsus alternans is present, however, and is relieved by digitalis, it would appear that not only is the relief temporary but that in many instances the slightest increase in the strain which is thrown upon the circulation may bring back the symptom which it is so desirable to put aside. In most cases of pulsus alternans the blood-pressure is considerably above what it should be, and this gives the impaired heart an undue amount of work. For this reason the administration of suitable doses of the nitrites along with digitalis may be efficacious, but, on the other hand, it is to be remembered that in some of these patients the maintenance of an abnormally high blood-pressure is necessary in order that the tissues of the body may be properly nourished, and if any attempt is made to lower blood-pressure to the approximate normal the patient suffers every evidence of circulatory failure.

Windle seems to prove pretty conclusively that the presence of pulsus alternans, although the drug has been accused of in-

ducing this condition, does not contraindicate the use of digitalis. If any evidences of dropsy develop digitalis would seem to be the remedy indicated above all others, and absolute rest in a chair or in bed is essential.

In regard to the matter of the dose of digitalis which should be given to these patients, it would appear that large doses, as a rule, are not necessary and, possibly, are unwise, since large doses are more prone to exaggerate pulsus alternans than small ones. By moderate doses we refer to five or eight minims of the tincture three times a day, and by large doses we mean to indicate quantities amounting to fifteen or twenty minims three times a day. If there is a specific history, and indeed in some cases in which there is no specific history, there can be no question that the simultaneous administration of full doses of the iodides, or mercurials, distinctly improve the condition of the heart; and the action of these agents may be materially fortified if arsenic is added, as, for example, in Donovan's solution.

ADRENALIN-PITUITRIN IN ASTHMA.

It has been suggested from time to time that the well-known influence exercised by adrenalin in asthma might be fortified and prolonged in effect by combining with it the active principle of the posterior lobe of the pituitary body, and a very considerable number of tests have seemed to show that such a combination produces good results, and, possibly, in some instances, definitely prolongs the antiasthmatic effect of the adrenalin. Little has been published, however, in regard to this combined method. As long ago as 1905 Kaplan published in the *Medical News* a report of the excellent results which he obtained by the hypodermic use of adrenalin, and a multitude of physicians have since that time amply confirmed his early observations, not only in America, but in England, France, and in Germany. So, too, clinicians in this country have shown that pituitary extract possessed value.

We are interested in a communication upon this subject made by Bensaude and Hallion to *La Press Médicale* of Aprii 8, 1918, in which they report their clinical observations upon the combining of these two active principles in the treatment of asthma. They find that in a majority of cases their experience confirms the observations of their predecessors, to the effect that the injection produces no disagreeable symptoms, although occasionally, after the first puncture, there may be some trembling sensations resembling electric irritation and some tachycardia. These, however, last only a few minutes.

After discussing the possible physiological action of these two drugs when combined and mentioning the researches which have been carried out by Wiggers, they conclude that the efficacy of this combined treatment is incontestable and can be generally utilized. So far as our own experience is concerned, adrenalin has been so satisfactory that we have not been tempted to follow the plan of combining the two preparations, and in the few cases in which we have made the combination the response has not been so great as to lead us to depend upon the dual method, rather than adrenalin alone. Possibly further experience will convert us to this combination.

THERMOTHERAPY IN GONORRHEA.

Because of the demonstrated thermal vulnerability of the gonococcus, this organism in laboratory tests perishing under a rise of temperature which may be sustained by some tissues without local death, efforts at a complete sterilization of an infected urethra by means of heat have been made practically since the discovery of the gonococcus as an infecting organism, a great variety of ingenious appliances having been invented, and each proving as fruitless as, if not more so than, its predecessor. In this relation Thom (*New York Medical*

Journal, March 23, 1918) notes that nearly sixty years ago in eastern Europe it was the custom of soldiers suffering with acute gonorrhea to place the penis between two hot roof tiles as long as the heat generated therefrom could be borne. The results were inflammation, swelling, and pain of the organ, and in a few days the disease was apparently cured.

Porosz is quoted as having obtained very good results by means of hot sounds. Marcus in 1903 devised a urethral electrode for the purpose of heating the urethral mucous membrane and thereby destroying the gonococci lodged therein. He discovered that the urethra could stand a temperature of 50° C. or 122° F. without discomfort or reaction. He also noted that this temperature had a decided sedative effect upon the inflamed mucous membrane. He employed no local anesthetic before introducing the electrode, and his treatment was directed entirely against chronic cases; he was opposed to its use in acute cases.

Finger demonstrated not only that the vitality of the gonococcus is extremely low, but that a variation of only 1° makes a vast difference in the effect produced on the gonococci; the effect at 40° C. being twice that at 39° C. Schminke used thermal penetration in the treatment of gonorrheal arthritis. He employed a temperature of 45° to 48° C., and his success in these conditions caused him to treat prostatitis and epididymitis in a similar manner.

The author developed an irrigation apparatus which enabled him to raise the temperature of the irrigating fluid to 50° to 52° C., which proved perfectly practical and efficient in chronic cases. Fulton is quoted as having used a hollow sound suggested by Dr. Valentine, through which water, heated to a temperature of 119° to 120° F., flows for half an hour. One treatment is said to change a purulent discharge into a watery one and to effect a cure in from twelve to fourteen days.

It has long been known that pyrexia, especially if high, will cause an abrupt cessation of a gonorrheal discharge. In typhoid and pneumonia this has been noted time and again. It has also been observed by Finger and others that an individual with a high fever cannot be inoculated with gonorrhea.

The ideal treatment would seem to be a combined local and systemic raising of the body heat; one to destroy the organisms *in situ,* the other by producing the necessary changes in the blood to destroy the toxins circulating therein.

Thom notes that he has invariably modified and reduced symptoms to the minimum by instructing his patients to take a Turkish bath several times a week, to remain in the hot room as long as possible, and to abstain from cooling off afterward. This treatment he supplements by hot permanganate irrigation and massive dosage of santal oil. Though he notes no diminution in length of time required to effect a cure, he records an entire absence of complications, such as epididymitis or posterior urethritis.

In this summary of treatment, which includes a rejection, as dangerous and inefficacious, of vaccines and serum, there is a revival of an effort which seems so entirely rational that its practically complete failure is difficult to understand.

COTTON-PROCESS ETHER.

The accumulated and concordant experience of the practical anesthetists to the effect that ether loses its anesthetizing effect proportionately to its purity; that the more the pharmacist rids it of other substances the greater quantity it takes to produce unconsciousness and relaxation, seem to corroborate the extraordinary findings of Cotton, now corroborated by Hudson (*Medical Record,* March 16, 1918), who gives Dr. James Cotton the credit of having spent about five years in the study of ether from both the chemical and physiological standpoints. Cotton has demonstrated that perfectly pure ether, for the manufacture of which an entirely new process had to be devised, is not an anesthetic at all, but produces, upon inhalation, merely a transitory stimulation similar to that of alcohol.

Commercial anesthesia ether contains two sets of impurities, one of which produces the anesthesia, the other the undesirable after-effects which have been so great a drawback to the administration of the drug. Cotton charged his chemically pure ether with only the desirable impurities, going beyond the proportions in which they exist in ordinary anesthesia ether. When this was done not only were the undesirable after-effects eliminated, but it was found possible to maintain an entirely new type of anesthesia, in which the patient whilst entirely anesthetic is perfectly conscious, can carry on a conversation intelligently, and can even walk about, although rather unsteadily. If the amount administered is reduced sensation begins to return, while if it is pushed the condition passes into ordinary surgical anesthesia, with loss of consciousness, but without any intervening stage of excitement.

These ideas seemed to Hudson so revolutionary that he paid slight attention to them, but since Dr. Cotton was to give a demonstration in Montreal he detailed an assistant to attend this and to make notes thereon. These notes mentioned impurities found in commercial ether, and further said that pure ethyl ether with the addition of ethylene or carbon dioxide will give complete analgesia without the loss of consciousness or without any unpleasant after-effects, Cotton holding that the sickness following the administration is due to alcohols and carbon monoxide. Superheated ether causes profound sickness after its administration.

A paper issued by the Canadian Medical Society, and based on Dr. Cotton's lecture on "New Ether," notes that ethylene is the gas present in commercial ether which is responsible for analgesia. It causes peripheral vasomotor spasm and circulatory depression.

Carbon dioxide may be used in place of ethylene, but the action is not so powerful and sleep intervenes usually before complete analgesia is obtained.

As to the demonstration, pure ether and ethylene was given to a cat. In three minutes it became anesthetic. It was suspended by one ear and its tail. It showed no evidence of discomfort and was able to see and walk around. The second demonstration was in the person of a Chinaman suffering from severe infection of the right arm. The patient was anesthetized in about 3½ minutes. Five incisions were made extending from the shoulder nearly to the elbow. During this procedure the patient was wide-awake and looking about the room, but suffered no pain. After the anesthetic was stopped about thirty seconds the patient complained of pain and was thoroughly awake while the dressing was being done. It was stated he showed no signs of nausea or ill feeling.

In a case of compound comminuted fracture of the right elbow, the patient was given pure ether plus ethylene to the extent of about 2 per cent by volume. The patient went under after about two minutes. Several small splinters of bone were removed, the patient remaining wide awake and talking, but complaining of no pain.

Hudson, the Medical Director of the Dupont Company, which handles enormous quantities of ether in the manufacture of smokeless powder, with the help of an ether chemist, prepared ethylene-charged ether under which about 58 operations have been done without loss of consciousness. The analgesic condition appears to be very similar to the "primary anesthesia" we can obtain with ordinary ether, but with the difference that while primary anesthesia is very brief Cotton's analgesia can be extended several hours if need be.

When the administration of the new ether is pushed to the condition of surgical anesthesia, it does not differ greatly from that of ordinary ether, excepting in its freedom from after-effects. It has one disadvantage in that recovery from it is unusually quick, so that in two cases in which it was used in this way and the administration discontinued at the usual time at the command of the surgeon, the patient promptly returned to full consciousness before he could be sewed up. Hudson believes that ethylene is not the only anesthetic car-

ried in ether, and that a little more research will disclose some deeper acting narcotic which, when also added, will give a perfect ether for surgical anesthesia. He holds that it is surely working in the right direction to add these substances in definite amounts to a perfectly pure ether, rejecting the harmful ingredients, now that we know that ordinary anesthesia ether is merely an accidental carrier of other substances.

REPORTS ON THERAPEUTIC PROGRESS.

HOW TO ADMINISTER QUININE.

In the *Indian Medical Gazette* for October, 1917, MACGILCHRIST points out that to know how to administer quinine properly we must know its chemical peculiarities and facts regarding its absorption by different channels.

He first considers administration by the mouth. Very little quinine is absorbed from the stomach, and that any at all is absorbed is due to the fact that quinine is a very diffusible substance. If given, therefore, in solution or in solid but very soluble form (*e.g.*, bihydrochloride), a little quinine enters the blood quickly and can be detected in the urine in about twenty minutes. In passing please note that MacGilchrist does not recommend administration of the solid very soluble form—*e.g.*, bihydrochloride—because quinine is very irritating (and if concentrated, even caustic) to mucous membranes, especially if abraded. [We doubt this.—ED.]

If quinine tablets be given on a stomach which is empty and free from acid, they may not be dissolved; even tablets of very soluble salts of quinine may pass through a catarrhal stomach without being dissolved. The chances of tablets of quinine, which have escaped undissolved through the stomach, being dissolved in the alkaline secretions of the intestines are small. In cases, therefore, in which it is suspected that tablets are not being dissolved, look to the condition of the stomach: and give quinine in solution with or soon after food when acid is expected in the stomach.

When a solution of a quinine salt enters the intestines, the alkaloid base quinine is precipitated from the solution of the quinine salt. Quinine alkaloid is very insoluble in water but is very soluble in bile. It is therefore useful to give a cholagogue, *e.g.*, calomel, before starting quinine treatment. In this connection MacGilchrist refers to the recognized efficacy of Warburg's tincture. Besides quinine, this tincture contains two or three cholagogues, and these cholagogues are purgative; it also contains astringents such as opium. Opium has a double action in this tincture: it counteracts (1) griping of the purgatives, and (2) the purgative action, thus preventing the quinine from being eliminated before it has a chance of being absorbed. The tincture also contains volatile oils, which similarly counteract griping. The efficacy of this tincture is largely due to the presence of the cholagogues.

Absorption of quinine from the intestines is very slow. If quinine is administered in solution on an empty stomach, absorption is at its height from the third to seventh hour after administration; if given with food, from the sixth to twelfth hour. Excretion of quinine is also very slow; after a single dose, traces can be detected easily in the urine after twenty-four hours.

From the above facts it is evident that the best way to administer quinine by the mouth for the treatment of malaria is to give it thrice daily with or soon after meals at intervals of eight hours. If given with or soon after food, it is obviously quite a minor matter which salt of quinine is used, as all salts will dissolve in the acid contents of the stomach. The sulphate is the cheapest salt; the hydrochloride and bihydrochloride are expensive, and, if given in such a way that they may exist in a concentrated condition in an abraded or damaged stomach, are injurious.

CONSERVATION OF FOOD BY PHYSICIANS.

The *Journal-Lancet* of December 1, 1917, states that in order to accomplish this result rationally the people must be instructed, first, in the selection of foods, procuring those which have reasonably high food values and are capable of producing a definite number of calories. Next, they must be instructed in the preparation of food in the kitchen, and particularly in the saving of food products in their preparation. It is notoriously true that in the country towns, notably in hotels, no attention whatever is paid to the selection of food and its preparation or to the wasting of food, when a little effort or a little foresight would correct these three chief factors in conservation.

For instance, to show the comparison between certain foods, the white potato, one of medium size, which weighs 3.5 ounces, contains 2.2 of protein, 0.1 of fat, and 18.4 of carbohydrates, and has a fuel value of 83 calories. Now contrast this with a cup of shelled almonds, which weighs about 5.6 ounces and has a fuel value in calories of 1035. One pound of beef marrow contains 3828 calories and shows its fuel value. Of course, a very small percentage of this is proteid, and a comparatively large percentage of it is fat. This shows that a cheap and easily procurable food may be of high caloric value. On the other hand, a pound of beefsteak, top of the round, has a food value of 652 calories. A loaf of white bread, weighing 12 ounces, produces 881 calories as its fuel value, while a loaf of gum-gluten bread, which weighs 13 ounces, contains 957.2 calories. A cup of butter, which weighs approximately 8 ounces, has a caloric value of 1744. Again, one cup of corn-meal, weighing 5 ounces, has 504 calories; the same amount of corn-starch has 592 calories. One cup of thick cream, 40 per cent, is capable of producing 864 calories. A pound of fowl contains 1015 calories, while one serving, approximately 5.5 ounces, contains 224 calories. Eggs, of course, have a small caloric value. An egg that weighs 1.5 ounces is equivalent to 60 calories. Again, a cup of hominy contains 805 calories, while one serving of lamb chops has a caloric value of 329. One cup of milk has a caloric value of 169. This means whole milk, while a quart of skimmed milk has a caloric value of 358. The man who sits down to a table and eats a pound of mutton chops gets 1640 calories, and it is not unusual to see big eaters consume this enormous amount; and yet they have wasted time in its consumption, and have gained virtually little. A cup of uncooked rice, which weighs approximately 8.5 ounces, has a caloric value of 795, while a cup of raisins, which weighs four ounces, has a caloric value of 352. It is well known that one pound of chocolate, which is served very freely to the armies, is equivalent to 2772 calories. It contains a large proportion of fats, a fair proportion of proteids, and a moderate supply of carbohydrates, so that, as a sustaining food product, chocolate has been recognized for years as a practical and nutritious food. One cup of granulated sugar, which is almost wholly carbohydrates, is equal to 840 calories, and is, again, a sustaining and heat-producing food.

Of course, to go all over the subject of foods and to differentiate between the different kinds would require a study of a book of practical dietetics. The above facts are set forth simply that the attention of the consumer may be called to the necessity of so compounding foods as to obtain a reasonable and rational diet. The average man at light work to sustain energy needs from 2500 to 2800 calories. The man at moderate work requires from 3000 to 3500, and the man at hard work from 4000 to 5000. Women require less comparatively, children rather more, according to age, and probably in larger proportions than do men and women. The aged man and aged woman get along comfortably on 1600 to 2000 calories a day.

[Mere caloric value does not tell the whole story. Thus a piece of coal contains many calories, but as it cannot be digested or assimilated it has no nutritive value.—Ed.]

PROPHYLAXIS IN CEREBROSPINAL SYPHILIS.

CORBUS in the *Journal of the American Medical Association* of December 22, 1917, states that it is his plan to continue treatment twelve months after obtaining a negative spinal fluid—that is, through two series of salvarsan injections of five each and ten months of rubbing.

On alternate nights, during the treatment with mercury, the patient is rubbed on the chest and the back. Twice a week a hot bath is given, and the ointment all rubbed off with soap and water. The patient is instructed to buy a tight-fitting undershirt, cut out the sleeves, and wear this all the time under his nightshirt and also under his daily underwear, taking it off only when he bathes. This shirt rapidly fills with mercury and becomes a veritable pad, keeping the body continually in contact with the mercury.

Then, too, it is believed that by wearing this mercurialized shirt the patient receives part of the mercury by inhalation. As he wears it continuously, night and day, some of the mercury is volatilized at body temperature, so that he has the additional advantage of mercury inhalation, with absorption through the skin. After a day or so the odor, which at first may be very annoying, is hardly noticeable.

This shirt should be worn by the patient for at least six weeks. There is no objection to his taking a daily bath, but he is not permitted to wipe the mercury ointment from his chest and back. He should pat himself dry with a towel.

During the treatment with mercury, it is absolutely necessary to keep all fruit, fruit acids, and buttermilk out of the patient's diet. If this precaution is strictly observed, with proper mouth hygiene, the gums will remain in a perfectly healthy condition. Equal parts of sodium bicarbonate and sodium chloride make an excellent tooth-powder, which will also help to preserve the gums.

Occasionally, after six weeks of mercury rubbings, iodides are substituted for a month; then the mercury rubbings are resumed. Corbus has no argument with those who prefer mercury injections to mercury rubbings. It is true that the rubbings are dirty, but in his hands this form of administration has been most effective.

In cerebrospinal syphilis the ideal method of prophylaxis consists in attacking the disease during the primary stage. If correct diagnosis is made and energetic treatment instituted at this period, there should be no further signs of the infection, and subarachnoid involvement would be unheard of. The general aim in treatment, especially among otologists, laryngologists, and ophthalmologists, seems to be the healing of superficial lesions only.

Lumbar puncture, with negative spinal fluid findings, is demanded in every case as final evidence of cure, no matter how energetically the treatment has been carried out.

As a check on possible future complications involving the nervous system, lumbar puncture, with spinal fluid examinations, is demanded in every patient who presents himself for treatment after the primary period.

In view of the results of his experience, extending over a year, with intensive salvarsan treatment and mercury rubbings, with spinal drainage, it is Corbus's belief that these constitute the most effective mode of treatment, at the same time causing the least danger to the patient.

STUDIES ON INFANT FEEDING WITH REFERENCE TO CALCIUM.

In the *Boston Medical and Surgical Journal* of December 20, 1917, BOWDITCH and BOSWORTH state that it has been previously shown by Van Slyke and Bosworth that cow's milk contains 0.175 per cent of dicalcium phosphate ($CaHPO_4$), and in this paper it is shown that this phosphate was not available as a food to children under four months of age, and only partly available to older children. This utilization of calcium phosphate by the older children is probably dependent upon the more abundant secretion of hydrochloric acid.

In connection with the results reported

here, it is of interest to consider the fact shown by Bosworth—that human milk, unlike cow's milk, contains no dicalcium phosphate, the mineral elements in human milk therefore being completely available as food for infants.

In calculating the amount of mineral elements present in modified cow's milk for use in infant feeding, the dicalcium phosphate should be considered as unavailable, and a corresponding deduction made from the total mineral elements in milk.

The writers have shown that during the process of digestion of calcium caseinate the calcium and phosphorus contained within the calcium caseinate may unite to form insoluble calcium phosphate and appear in the feces as such, the calcium and phosphorus balances under these conditions becoming negative.

The writers have also shown that by feeding a large amount of soluble calcium it is possible to precipitate practically all the phosphorus in the food as insoluble calcium phosphate, this substance being eliminated in the feces, and as a result of this the metabolism of phosphorus is reduced to such a low level that the urine becomes phosphorus-free.

THE INTRAPERITONEAL INJECTION OF SALINE SOLUTION.

In the *American Journal of Diseases of Children* for January, 1918, BLACKFAN and MAXCY remind us that the parenteral administration of water is a widely used therapeutic measure in the treatment of the severe nutritional disorders of infants, especially when, after continued vomiting and diarrhea, marked loss of body fluids has resulted. It is an efficacious means of combating this serious complication.

Without entering into a discussion as to the relative merits of the procedures used to introduce water, it may be said that the methods which have been employed leave much to be desired. The vomiting and diarrhea are usually so severe in the cases that require water that they prevent its administration by mouth or rectum. Intravenous injection is often difficult, and it is rarely possible to inject an amount sufficient for the purpose without throwing too great a burden on the circulation. The subcutaneous method is the one on which chief reliance has been placed. In the hands of the writers the results from this method have been disappointing. Absorption from the subcutaneous tissues is often very slow and after repeated injections is almost *nil*.

An efficient method for the administration of water for therapeutic purposes must fulfil several important requirements: (1) It must admit of the administration of comparatively large amounts at one time and permit of repetition at frequent intervals; (2) the water must be quickly absorbed; (3) the method must be simple of procedure, practicable, and accompanied by a minimum of risk to the patient.

The writers believe that the injection of water directly into the peritoneal cavity fulfils all of these requirements. By water they mean physiologic sodium chloride solution; the water is the essential element, and they believe that physiologic sodium chloride solution is as effective as any of the other solutions which are recommended. It may be that as more information regarding the loss of salts in diarrheal conditions is obtained, a solution better meeting the requirements may be found. This method is not original with the writers. They have employed it at the suggestion of Dr. Howland, who saw it used as a routine measure in the service of Professor Garrod at St. Bartholomew's Hospital, London. No reference to this method has been found in the literature. It has been used extensively in the Harriet Lane Home, the Johns Hopkins Hospital, for the past two years with such satisfactory results that the writers consider it a distinct improvement on any of the other methods that they have used.

The amount of water that can be given depends on the size of the patient. In small infants 100 to 250 Cc. may be introduced, and the injection can be repeated every twelve tc twenty-four hours. In larger infants a greater amount (300 to 400 Cc.) may be given at one time. The writers

have observed no untoward effects from the injection of such amounts, even when they have been frequently repeated.

The rapidity of the absorption of fluid from the peritoneal cavity is shown by the experiments of Dandy and Rowntree. They found that 40 to 60 per cent of phenolsulphonephthalein in solution was absorbed in one hour. The absorption took place directly into the blood stream and was not influenced by posture. Clinical evidence of its rapid absorption in patients the writers have treated is shown by the fact that the distention of the abdomen which usually follows the introduction of water intraperitoneally subsides after a short time. In a moribund patient 200 Cc. of normal saline solution were injected, and the patient died six hours later. At the necropsy, which was performed immediately, less than 50 Cc. of the solution were recovered.

When this method is used great care in technique should be exercised. After considerable experience in the wards, however, controlling the method with animal experiments and with the findings at necropsy, the writers have become convinced that the attendant dangers are minimal. They have never seen any complications follow its use.

The technique is as follows: The patient lies in the recumbent posture with the movements of arms and legs restricted by a restraining jacket. The most favorable site for the introduction of the needle is through the linea alba just below the umbilicus. The skin is prepared after the usual surgical method, with iodine and alcohol, and the area may be rendered anesthetic with ethyl chloride. The solution is introduced by gravity from an infusion bottle. When the patient is restrained in the proper position and the site for the injection prepared, the skin and subcutaneous tissues are picked up between the thumb and the index-finger, and the needle, pointing upward, is inserted at an oblique angle. After it has penetrated the peritoneum the fluid is allowed to flow into the peritoneal cavity.

The injection of the fluid is continued until the abdomen becomes slightly distended. It should not be introduced too rapidly or in too large quantities, to avoid the possibility of embarrassing the respiratory and circulatory systems; 100 to 250 Cc. can be introduced in from fifteen to twenty minutes. The fluid flows in so rapidly that the solution does not become cooled below that of the body temperature. After the fluid has been introduced, the needle is withdrawn and the puncture wound covered with a sterile dressing. The injection may be repeated after twelve to twenty-four hours, if necessary. The injection may be made, if desired, outside of the left rectus muscle about half-way between the costal margin and the left anterior spine of the ileum.

The beneficial effects are first apparent in the general appearance of the patient. The feeble whine is often replaced by a stronger, more vigorous cry. The extreme restlessness lessens, and thereafter the child frequently sleeps in a normal manner. The tongue, lips and the skin become moist, the fontanelle is less depressed, and the gray cyanosis or pallor disappears. The most striking change is the alteration in the facial expression. The eyes are less sunken and the anxious, painful expression is often lost. In a number of instances the writers have observed a very marked increase in the pulse rate and in the secretion of urine. The improvement is often so marked that only one injection has been necessary in patients who were in an apparently hopeless condition on admission. Occasionally a febrile reaction follows the introduction of the fluid. The temperature may range from 100° to 103° F., but it usually subsides after twelve to forty-eight hours. After the introduction of water the weight in some patients remains stationary, while in others there may be a gain in weight. After repeated injections there may be edema. A marked increase in weight is rarely permanent, but even with the loss of weight in such instances the improved general condition of the patient is maintained.

The results have been so encouraging that the writers have adopted this method in the treatment of all cases of severe gastrointestinal disturbance when the introduction

of water in sufficient quantity by mouth is impossible. If the condition of the patient demands it the intraperitoneal injection is made immediately on admission to the hospital. The indications for repeating the intraperitoneal injection are the general condition of the patient and continuation of vomiting. When the vomiting has ceased water is given by mouth, and as early as possible thereafter the food which is indicated is begun. In patients with acidosis, alkaline therapy as recommended by Howland and Marriott is used.

The writers do not wish to give the impression that the intraperitoneal route is to be used to the exclusion of the other prescribed methods for introducing water. Each serves its purpose. They do, however, recommend its use in cases in which the introduction of water as a therapeutic agent is urgently demanded.

HEMORRHAGE FOLLOWING REMOVAL OF THE TONSILS.

MOORE in the *Practitioner* for April, 1918, quotes much of the recent literature. He states that Citelli has reported on the advantages of pituitary extract given subcutaneously in controlling hemorrhage following turbinectomy, sinus operations, and tonsillectomy.

Kahn and Gordon have made further investigations, and summarized their results in fifty cases of removal of tonsils and adenoids as follows:

1. The blood loss was greatly reduced.

2. The coagulation time of the blood was reduced from one-third to one-half or more after a hypodermic administration of pituitrin in doses of ten minims to children and fifteen minims to adults.

3. The coagulation time was decreased within fifteen minutes, and it remained so for over twenty-four hours.

4. Pituitrin increases the strength of the heart-beat, and decreases its frequency. It undoubtedly has a vasomotor-constricting effect as well as a coagulating effect.

Gordon refers to one hemophilic case in which the coagulation time was fifteen minutes, and this was brought down to three minutes.

In these respects it has great advantages over calcium lactate, and can, therefore, be recommended as a prophylactic given fifteen to thirty minutes before removal of the tonsils.

The question of serotherapy has been well summarized in a paper by Hall Forbes. Subcutaneous injections of fresh blood serum have been found to possess a curative as well as a preventive value in the treatment of hemophilic bleeding, purpura, and pernicious anemia, by supplying the deficiency of fibrin. By this means traumatic hemorrhages in hemophilics have been arrested.

Horse serum is said to yield more uniformly satisfactory results than any other animal serum. It may be given in doses of from 10 Cc. to 25 Cc., and its effect may be obtained in from twenty-five to forty-eight hours after the injection, and persists for at least three weeks. This point is of special importance in operative work on patients suffering from latent hemophilia or from purpura.

Coagulose (hemostatic ferment), a sterile soluble powder, prepared from the normal blood serum of the horse, contains the fibrin ferment necessary for coagulating blood, and may be used subcutaneously (0.65 gramme added to 6 or 8 Cc. of sterile water—the equivalent of 10 Cc. of blood serum) as well as locally in its powdered form as a styptic. It has been found useful by some observers as a prophylactic before operations on the throat.

Cecil Graham uses horse serum given by the mouth as a routine practice, and advises that 10 Cc. should be given in the evening before operation and another 10 Cc. an hour after operation. In a case of hemophilia, in which the coagulation time was found to be fifteen minutes, he was able to reduce it to six minutes, in eight weeks, by means of horse serum and calcium lactate; he then enucleated the tonsils with Elphick's hemostatic guillotine, the operation being almost bloodless. Hill recently adopted these methods, after a three weeks' prepara-

tion, in an alleged hemophilic boy; the immediate bleeding was much below normal, ceased with pressure, and there was no secondary hemorrhage. The result, however, may have been mainly due to the use of the hemostatic guillotine.

THE QUESTION OF SALICYLURIC ACID IN SALICYL URINES.

To the *Journal of Pharmacology and Experimental Therapeutics* for December, 1917, HANZLIK contributes another paper on the salicylates. He believes that the methods which have been hitherto used for isolating what was supposed to be salicyluric acid did not yield, when applied to salicyl urines, any notable quantity of any pure product. The products that are obtained are not well characterized, do not have any distinctive properties, and apparently do not contain glycocoll.

From this it appears improbable that salicylates are converted into salicyluric acid in the human and animal organism. The products that have been interpreted as "salicyluric acid" were presumably more or less impure salicylic acid, that had been imperfectly separated in the process of isolation.

THE TREATMENT OF NEURASTHENIA AND PSYCHASTHENIA FOLLOWING SHELL SHOCK.

In the *British Medical Journal* of December 1, 1917, WILLIAMS expresses the belief that the patient should be told that he is not suffering from any disease which is dangerous to life, that he will undoubtedly recover, and that perseverance in the line of treatment advised is most important. He should be kept as cheerful as possible. As will be mentioned subsequently, all war news should be cut off at once and conversation about the war should be avoided.

At first a short period of complete rest is desirable, and this is well combined with the "sleep treatment" described in the next section. He should be well fed and any gastric or intestinal trouble treated. The bowels should be kept regular, and any affection of the abdominal or thoracic organs or any other ailments (malaria or dysentery) or their results should be carefully treated. In suitable weather the bed or sofa should be drawn into the open air and sunshine when a garden is attached to the hospital or house where he is treated.

In a large number of the cases the patient sleeps very badly indeed, for weeks or months, and may be able to sleep only for two or three hours or less every night. Often when awake at night he is thinking of his experiences at the front. It is most important to try and check the insomnia as promptly as possible. Trional is one of the most useful drugs Williams has tried; in a few cases 30 grains of potassium bromide, with small doses of chloral hydrate, and tincture of opium, or syrup of codeia, is sometimes very useful. Other drugs will also be of service. If adalin or chloralamide can be obtained they are very suitable.

When the patient is able to sleep better he often improves rapidly, but in some cases after he is able to sleep well the symptoms continue, especially if he is fearing a return to the front or if he is constantly thinking over his experiences. On the other hand, as already mentioned, if the patient sleeps unsatisfactorily the symptoms often continue even when all dread of further war risk ceases. During the day very often the patient is constantly thinking about his experience of the shell explosions, and the war, or of his symptoms, except when he is occupied by reading, conversation, or in some other way. A very important point is to check thinking on these subjects.

For this a sleep treatment for a few days is often useful. The patient is kept asleep part of the day as well as the night by drugs; potassium bromide may be given three times during the day in addition to the trional or bromide at night, or trional is given at night, and after dinner at midday. Or a mixture containing potassium bromide, with small doses of chloral hydrate and tincture of opium, may be given two or three times during the day (in place of

the bromide or the trional). But the dose of the drugs should be carefully regulated, and only just sufficient should be given to keep the patient asleep part of the day. The drugs should be continued for a few days only, and discontinued at once if bad symptoms are noted. He should be closely occupied when awake by something interesting to him—games, draughts, dominoes, patience, billiards, handwork, netting, jigsaw puzzles, reading, etc. In summer when the weather is suitable, the bed may be drawn into the open air if a garden is adjacent to the hospital or bedroom. This sleep treatment may be carried out for four or six days, but it should be very carefully observed.

If the patient can sleep well during the night and half of the day he often improves decidedly. After a dose of 15 grains of trional at night one of Williams's patients would constantly sleep all night and all morning until midday or 1 P.M. But often another dose of trional after midday dinner is useful. Some require very large doses of drugs before they sleep; in these cases we may be content with sleep during the night alone, and the drugs should not be pushed and should be discontinued during the daytime.

This sleep treatment is often of very great service for a week at first, but for some time trional or other drug may be required at night.

REPORT ON THE TREATMENT OF MYELOGENOUS LEUKEMIA WITH RADIUM.

In the *Boston Medical and Surgical Journal* of December 20, 1917, PEABODY expresses the belief that the results from the use of radium may be discussed from the point of view of its effects on the general symptomatic condition of the patient, on the splenic tumor, and on the blood picture.

One of the most striking results of radium therapy in this series of patients with leukemia has been the general clinical improvement. Without exception the cases treated during the last eighteen months (the duration of personal observation by the writer) have shown symptomatic improvement, and in some instances the change has been little short of remarkable. Patients who were at one time bedridden, extremely weak, pale, dyspneic, and apparently in a very serious condition, have regained their strength and have subsequently returned to leading a comparatively normal life. Almost all of the patients who have been closely followed during the past year and a half are at work or performing their usual household duties. The appetite improves, the digestive disturbances gradually become less, and weight is usually gained. Headache is often relieved, and buzzing, roaring, or "beating" in the ears, a common and disagreeable symptom, frequently diminishes, and is sometimes completely cured. In one instance with complete deafness, the hearing was not improved even after many treatments with radium.

When first seen the patients have a large, often an enormous spleen, but under the influence of radium a rapid decrease in size takes place. In many cases the spleen diminishes so that its lower pole is above the costal margin, and in some instances it has become so small as not to be palpable. Occasionally it may be impossible to reduce the size of the spleen so satisfactorily, and it remains enlarged so that the lower edge is well below the ribs. In one case the spleen became greatly enlarged during a terminal exacerbation of the disease and continued so in spite of vigorous treatment until the patient's death. In general, the patients in whom radium therapy produces a decrease in the size of the spleen seem to be the most favorable cases for treatment. The shrinking of the spleen may be a rapid process, and an organ which has filled nearly one-half of the abdominal cavity may disappear behind the ribs in the course of eight and a half weeks and after thirteen treatments.

The most definite effect of the application of radium in myelogenous leukemia is on the blood picture. In cases which have received no previous treatment and which

have a high leucocytosis, the number of white cells usually begins to fall in from 24 to 72 hours after the radium is applied. The decrease in the leucocytosis is often rapid and continues for days and even several weeks after the radium was administered. In one patient the white count dropped from approximately 100,000 to 6100 in twenty-five days, radium having been given on the first and thirteenth days only. Even more striking results have been observed in other instances. Associated with the decrease in the total leucocyte count there is a change in differential count. Myelocytes and immature forms of polymorphonuclear leucocytes become less prominent and a larger proportion of adult polymorphonuclear cells is found. Usually, however, careful searching will always reveal the presence of a limited number of typical myelocytes. Patients with an anemia, who respond well to treatment, show a rise in hemoglobin and in the red cell count associated with their improvement. On the other hand, the development of an anemia in a case under observation is to be regarded as a serious sign. A fall in hemoglobin and the occurrence of many nucleated red cells is of serious prognostic significance, but the picture may improve in response to radiation. An important point to bear in mind is that the development of anemia may be the result of too much radiation. It is almost certain that this took place in one patient who died with a low white count (2000), and a hemoglobin of 10 per cent. This case, which presented remarkable pathological lesions, will be reported in detail by Dr. Goodpasture.

While it is comparatively easy in most cases to bring the leucocyte count down to normal, it is much more difficult to keep it there. A remission usually takes place after a few weeks, and more radium must be applied. The attempt has been made to treat patients soon after the white count began to rise, and by prompt application of radium it is possible to keep the count at from 5000 to 40,000 or 50,000. Often the leucocyte count will remain within normal limits without any treatment. One patient came into the hospital in January, 1916, with a bad clinical relapse and a white count of 248,000. His leucocytes were reduced to 6000 on February 29, 1916, and remained below 17,400 without any treatment until November 23, 1916. In general there seems to be a close parallelism between leucocyte count and clinical condition. When patients report that they are feeling poorly the white count is frequently found to be high. This is not always true, however, and patients seem to do well clinically if their leucocyte count is not over 50,000. The white count, however, is the best routine guide to treatment, and the attempt is always made to keep it within normal limits. The intervals at which it has been necessary to administer radium have varied greatly from case to case in any given individual, but they have perhaps averaged one to three months.

In one of Peabody's cases a few applications of radium were made over the long bones, but in all other instances treatment has been applied over the spleen.

EXPERIMENTS ON THE THERAPEUTICS OF AMEBIC DYSENTERY.

As a result of an investigation made by DALE and DOBELL they reach these conclusions in the *Journal of Pharmacology and Experimental Therapeutics* for December, 1917:

1. Two strains of entamœba histolytica were established in kittens: One, from vegetative ameba injected per anum, was transmitted through 43 passages; the other, from cysts injected into the stomach, through six passages. In neither case did the strains alter perceptibly in character with successive passages.

2. Various alkaloids and other substances, including the natural alkaloids of ipecacuanha and artificial derivatives therefrom, were tested on the amebæ ***in vitro***. Emetine and the other alkaloids of ipecacuanha exhibited no characteristically high toxicity for the amebæ, as compared with that of some other alkaloids. Certain samples of entamœba histolytica from the kittens survived the action of 1-in-1000 and

even 1-in-100 emetine, for periods up to one hour. Amebæ which survived treatment by 1-in-1000 emetine were found to be still capable of infecting kittens.

3. Experimental dysentery in kittens was refractory to all kinds of treatment. Neither the ipecacuanha alkaloids, nor other substances having a powerful action on the amebæ *in vitro*, could cure the infection or definitely modify its course.

4. Methyl-psychotrine, a natural alkaloid from ipecacuanha which is more toxic for entamœba histolytica, when tested *in vitro*, and much less toxic for mammals than emetine, has been tested clinically on cases of amebic infection in man. It appeared to be entirely devoid of therapeutic action, though given in relatively very large doses.

5. On the basis of these results it is suggested that the theory of the mode of action of emetine in amebic dysentery needs reconsideration. Alternatives are discussed to the theory of direct amebicidal action, which seems to be no longer tenable; and it is suggested that the therapeutic efficacy of emetine is a result of its action upon the host rather than upon the parasite.

THE DISINFECTION OF PNEUMOCOCCUS CARRIERS.

In the *Journal of the American Medical Association* of January 5, 1918, KOLMER and STEINFIELD state that as the investigations of Morgenroth and Levy, Wright, Moore and Cohen, Kolmer and Heist have shown the high pneumococcicidal activity of ethylhydrocuprein hydrochloride, and, as found by the latter, that other cinchonics, as quinine and urea hydrochloride and quinine bisulphate, also possess considerable pneumococcicidal powers, they have made their studies on the disinfection of sputum and of the mouth with solutions of these various cinchonics in a menstruum of liquor thymolis, their experiments having demonstrated that the latter solution alone in dilution of from 1:4 to 1:10 possesses some germicidal activity for pneumococci and aids in disguising the bitter taste of cinchona compounds. They have approached this problem mainly from the laboratory side, employing both normal mouth secretions harboring Type IV pneumococci and the sputum of pneumonia convalescents harboring Type I pneumococci, the pneumococcicidal activity of the disinfectant under study being largely determined by mouse inoculation.

The results of Kolmer and Steinfield's experiments with sputum have indicated that dilutions of ethylhydrocuprein hydrochloride as high as 1:30,000 and even to 1:160,000 had appreciable and frequently well-defined pneumococcicidal activity, while a 1:10,000 dilution almost invariably disinfected sputum containing pneumococci, as determined by intraperitoneal injection in mice. With such cinchonics as quinine bisulphate, dilutions in sputum varying from 1:10,000 to 1:20,000 were found to possess well-defined pneumococcicidal activity.

After many trials they found that 1:10,000 dilutions of ethylhydrocuprein hydrochloride or quinine bisulphate, quinine hydrobromide, and other cinchonics in a 1:10 solution of liquor thymolis, constitute mixtures that may be readily used by persons as mouth-washes and gargles. The slightly bitter taste remaining after the use of any of these is readily removed by rinsing the mouth with plain water. Experiments consisting in mixing sputum containing Type I or Type IV pneumococci with these solutions, and determining pneumococcicidal activity by injecting portions into mice at varying intervals, have demonstrated pneumococcicidal activity, particularly in the case of ethylhydrocuprein hydrochloride.

In view of the established fact that a considerable percentage of persons in contact with cases of lobar pneumonia due to Types I and II pneumococci became carriers of these pneumococci, and that convalescents may carry them for varying intervals of time averaging from three to four weeks, the use of a mouth-wash and gargle of ethylhydrocuprein hydrochloride is suggested as worthy of clinical trial by those persons who have come in contact

with cases of lobar pneumonia, and also by the patients themselves and persons suffering with measles or other infections favoring the development of lobar pneumonia. The systematic use of 1:10,000 solution of ethylhydrocuprein hydrochloride in 1:10 dilution of liquor thymolis twice or more daily is not dangerous from the standpoint of toxicity due to swallowing portions of the drug, is not unpleasant, and may aid in ridding the mouth of virulent pneumococci, among contacts at least. Since this drug is scarce at present, one of the commoner cinchonics, as quinine bisulphate or quinine hydrobromide, may be substituted, although these are not as powerful pneumococcicides. Similar dilutions in undiluted Dobell's solution may be used for douching or spraying the nose, or, incorporated in a dental cream, for cleansing the teeth. For washing the mouth and gargling, a solution is conveniently prepared after the following formula:

Ethylhydrocuprein hydrochloride, 0.005;
Liquor thymolis, 5.0;
Distilled water, sufficient to make 50.00.

As previously stated, the systematic use of either of these mixtures may serve to destroy or inhibit the multiplication of virulent and disease-producing types of pneumococci among contacts and convalescents, and thereby aid in the prophylaxis of lobar pneumonia.

CARE OF THE EARS.

PHILLIPS contributes a paper of a practical type on this topic to the *New York Medical Journal* of December 22, 1917.

Regarding suppurative diseases of the ear, the infectious process must enter the middle ear through the Eustachian tube in order to cause abscesses. Middle-ear abscesses usually arise from grippe or severe colds which more or less exhaust the patient. The onset is characterized by severe pain in the ear accompanied by fever. A patient suffering with this disease should be confined to bed for several days. The drum membrane should be opened by a physician as soon as it is determined that an abscess is present without waiting for the abscess to open spontaneously. Discharge follows, and the external canal should be douched with warm sterile water several times a day. In other words, the patient should rest in bed and have the external ear kept perfectly clean. The nose and throat should be looked after. In the way of prevention in young children, all who have large tonsils and adenoids should be submitted to operation, especially after they have reached the age of four years. Phillips wishes to emphasize the importance of abscesses in the ears being completely cured, for there never should be such a thing as chronic discharge from the ears. These are all due to neglect. In a small proportion of cases the mastoid operation should be performed, and failure to submit to this operation when needed results in chronic running ears with bad odor and a great deal of danger to life, whereas the timely mastoid operation will terminate the discharge and leave the patient with good hearing. It is a mistaken idea that to puncture the ear drum will result in deafness. The ear drum has but little to do with the function of hearing.

Finally, Phillips speaks of the treatment or management of inner ear deafness. This is usually not amenable to local treatment of any kind. Occasionally some of the aids to hearing may be employed with some benefit with this type of deafness, but the same aids are more helpful when the deafness is due to middle-ear disease. Many of these patients have become totally deaf, and they must be taught some other way of conversing. Lip reading is of great benefit. A person of good eyesight and quick perception can become adept at lip reading. Phillips heartily recommends it to those who are nearly totally deaf, and there are schools, some held in the evening, where instruction can be obtained. For young children who are congenitally deaf or have acquired deafness at a very early age it is most important that they begin school work extremely young. Private teaching for this is best, but unfortunately private teaching is expensive.

OBSERVATIONS ON CASES OF PNEUMONIA IN RELATION TO TYPES OF PNEUMOCOCCI AND THE SERUM TREATMENT OF TYPE I CASES.

In the *Boston Medical and Surgical Journal* of December 20, 1917, ALEXANDER states that the mortality of his series of cases was 18.2 per cent, if a case dying of pulmonary embolism during convalescence is included. If this patient is not included as not having died as the direct result of the pneumonia, the mortality was 9.1 per cent. This, when contrasted with the 42.8 per cent death-rate of Type I cases not receiving serum treatment, indicates the therapeutic value of antipneumococcus serum. [For Type I.—ED.]

ADEQUATE TREATMENT FOR SYPHILIS.

To the *American Journal of Syphilis* for January, 1918, IRVINE contributes a paper with this title and divides his advice as follows:

Cases of Early Primary Syphilis with a Negative Wassermann and no Glandular Involvement.—Under this heading may be considered patients having present an initial lesion with positive spirochete findings, no glandular involvement, and a negative Wassermann. These are fit subjects upon which to attempt the following abortive treatment:

It will be of advantage to excise the lesion, if such a course is practicable. At least six doses of salvarsan should be given at weekly intervals. Not less than a six weeks' course of mercury injections or inunctions should be given, and this followed by another six doses of salvarsan. In such a case, if the Wassermann, done at frequent intervals, and clinical symptoms remain negative, the possibility of cure is good.

Cases with Initial Lesions, Glandular Involvement, and Positive Wassermann.—Such cases must be considered in exactly the same light as an established secondary syphilis, and require an equal amount of treatment. Unless this is done, experience in large clinics has demonstrated a very large percentage of later recurrences.

Cases of Established Secondary Syphilis.—Under this heading may be considered cases with infection dating back from six to eight weeks to several years, having any of the following symptoms: roseola, muscular, papular, or pustular eruptions, mucous patches, gummata, periostitis, etc., and a positive Wassermann. The attending physician must make a choice as to whether to use salvarsan or mercury first. If the patient has infectious lesions, it is urged that salvarsan be given at once to quickly heal these.

First Year.—During the first year in such cases, not less than eight or ten doses of salvarsan should be given, and either in combination with or between the series of salvarsan injections not less than three courses of mercury injections or inunctions should be given. Each course of mercury injections or inunctions should last from six to eight weeks.

Second Year.—(A) In the second year, if the Wassermann remains positive or recurrence of lesions takes place, repetition of the first year's treatment is suggested.

Second Year.—(B) If the Wassermann has become negative, and remains negative, and there has been no recurrence of any symptoms, not less than six doses of salvarsan should be given, preferably in two series, and at least two courses of mercury injections or inunctions should be given.

Third Year.—For cases coming under the second year A is to be followed, if the Wassermann has been positive, or if there has been recurrence of lesions in the second year, at least as much treatment as is suggested for second year B should be repeated. If the Wassermann has remained negative, and there has been no recurrence from the first year, a large percentage of cases will likely remain well, and may pass into the period of observation. In the case of patients having a positive Wassermann, or recurrence of symptoms after completing the two years' treatment, a competent syphilologist should be consulted or the patient referred to such a one that adequate individual treatment may be given.

Early or Late Nerve Involvement.—

Usually in such cases the treatment is too individualized to be covered by general rules. It may be said, however, that such cases require more treatment, perhaps double the number of doses of salvarsan, and three or four years' treatment, instead of two or three years.

Tabes and Paresis.—Modern treatment of tabes has in many cases produced brilliant results. The question of intravenous and intraspinal medication is more or less unsettled, but it may be said in general that the results depend upon salvarsan medication, and that a great many more doses are needed than in other cases (as high as twenty or thirty). It is frequently necessary in these cases not only to start with small doses, but to continue with them. It is suggested with this type of case that either a competent syphilologist be called in consultation or the patient be referred to one. Results in paresis are questionable. In some cases conditions have been alleviated by intravenous or intraspinous treatment. As with tabes, the treatment must be considered in an individual way, and it is suggested that a competent syphilologist or neurologist be consulted.

Cases of Hereditary or Congenital Syphilis.—In general these patients require longer treatment than is necessary for earlier cases of acquired syphilis. There are at least two reasons for this: First, these young patients have not the amount of inherent resistance to disease; and second, they cannot, as a rule, stand such intensive treatment as can be given to an adult. In general the same treatment should be given as to an established case of acquired syphilis; not less than twelve or fifteen doses of salvarsan (necessarily of proportionately smaller dosage) and at least five or six courses of mercury inunctions. Injections in most cases are practicable. Internal treatment is likewise to be condemned in these patients. At least 80 per cent of such of these patients as show lesions will have iritis or keratitis, and better and quicker results are to be expected from graduated doses of salvarsan given in weekly intervals than from mercury and iodides. As is the case with a few adults, many of these patients show a persistently positive Wassermann, in spite of long-continued treatment. Just what this means is not yet established. However, every effort should be made to secure a permanently negative Wassermann.

Since the advent of salvarsan, iodide of potassium is occupying a less important place in the therapy of syphilis. It is particularly valuable in stimulating the healing of lesions where there is a considerable cellular infiltration, and in periostitis, in specific headache, and in nerve syphilis. Many men give it as a routine in courses when the patient is resting from more active treatment.

It is not an easy matter to say when a patient is cured. There are undoubtedly a few patients cured with a comparatively small amount of treatment, but in laying down general rules governing cases, safety can be secured only by giving each enough to cure the majority. This may result in overtreating some cases, but better overtreat any number of patients with so serious a disease as syphilis than undertreat one. In the first place, then, a cure can only be considered after the patient has had a sufficient amount of treatment. Emphasis should be placed on this point, as many patients have been told they were well on securing a certain number of negative blood tests, even if only six or eight months' treatment had been given. Negative Wassermann tests secured during the period of treatment are not sufficient evidence upon which to pronounce a cure. They indicate only that satisfactory progress is being made. It is extremely important that all patients who have concluded the necessary treatment be kept under observation and that the question of cure be not settled until the end of this period. It is considered necessary that a period of at least two years be devoted to observation, during which time tests be made of the blood, and in many cases of the spinal fluid. Examinations should be made at least every three to six months, including a blood Wassermann, and most syphilologists agree that a

final spinal fluid test should also be made in all cases. As to what should be done with a patient showing some positive test or symptoms, during the observation period, consultation is suggested. It is possible in so brief a paper to cover only majority cases, and no effort has been made to suggest treatment for exceptional individual cases.

DACRYOCYSTITIS.

In the *Albany Medical Annals* for January, 1918, STAPLETON says that many forms of treatment for dacryocystitis have been devised and carried out; some have been somewhat successful, others less so. Probably the first treatment was a slitting of both tear ducts and washing the sac with an antiseptic solution such as bichloride of mercury, $AgNO_3$ iodine, etc.; then through the slit ducts sounds were passed down through the lacrimal sac to the nasal duct into the nose, beginning first with the smaller sound and finally using the very largest. Occasionally such treatment resulted in a cure, but very often the results were disappointing, the patient having submitted to considerable loss of time and suffering, without any promise of relief. Another method tried was the destruction of the sac with the actual cautery or trichloracetic acid. Some of these cases came out favorably, others did not.

West of Berlin advised an operation whereby he opened the nasal duct and removed a piece of the lacrimal sac intranasally. The result of this operation in his hands appeared to be good. He has had a large number of sac cases, and, of course, has become very skilful in operating. In the hands of the average skilful operator his method has not turned out so well. Stapleton has seen six of these cases operated intranasally, with about fifty per cent cures. Toti, of Florence, Italy, devised the operation in which he made an incision through the sac externally and punched a hole in the lateral wall of the nose over the sac, and he also reported fairly good results.

Lastly, Miller, of Vienna, worked out the operation in which he dissected the sac out in its entirety under local anesthesia, doing practically a bloodless and painless operation. This is the operation with which Stapleton is most familiar, and he showed some of the results. Two of the cases he presented were of thirty-five years' standing; one was in a child six years of age, the condition existing since birth; one was fistula; one was an acute exacerbation with a tumor formation about the size of the end of a thumb; and the others were chronic cases. In all Stapleton performed the same operation, although books and authorities say that the extirpation of the sac is contraindicated in acute cases or in acute exacerbation of chronic cases. Yet some of the cases he operated upon were acutely inflamed, and with a total extirpation of the sac made just as good a recovery, if not better, than those in which a chronic inflammatory condition existed without the acute exacerbation. In fact, Stapleton found it easier to excise the sac in these cases than in the chronic cases.

The principal thing in these operations is to know perfectly the anatomy of the parts upon which you are working, to get a perfect anesthesia from the cocaine in the parts you inject, and to bleach the parts thoroughly with the adrenalin used. The amount of blood which covers the field is practically *nil*, and one can dissect out the sac with little or no trouble.

Stapleton does not describe this operation in detail as a very fine description is given in English in Meller's "Ophthalmic Surgery," which can be obtained at any medical library. Meller has removed the lacrimal sac in a great many cases and takes but a very few minutes to do it. Personally, Stapleton thinks it wise to practice on the cadaver a number of times, learning the steps of the operation and the anatomy of the parts upon which one is working; then it is not a difficult matter to operate on the living. There are certain landmarks to be observed, and these the operator must keep in mind constantly, as a slight deviation from the principles laid down for the operation may get one into trouble. Fre-

quently men have difficulty in finding the sac; again, the orbital cavity may be opened by cutting through the posterior fascia which separates the sac from the orbit, and the orbital fat may project into the wound, causing hemorrhage from the vessels in this region. The third difficulty is the incomplete removal of all the mucous membrane, for even if the smallest piece of membrane is left, it will go on secreting and the operation will be a failure; besides, the patient will probably have a fistula with a discharge running over the face.

This operation is indicated in cases in which the patients have not the time for a long treatment with sounds, as we are not sure of ever getting particularly good results using this method. This holds true for working people especially. Sac operation should precede an iridectomy or cataract extraction if the sac is involved, also in cases of corneal ulcer, as the ulcer does not tend to clear up as long as there is a chronic discharge constantly flowing over this region, and in all cases of chronic blennorrhea in which the sac walls are markedly thickened, with a total occlusion of the lacrimal nasal duct where we have a formation of fistula.

THE LIMIT OF RECOVERY IN HEMIPLEGIA.

The *Boston Medical and Surgical Journal* of January 10, 1918, emphasizes the fact that any attitude toward our patients which is in the direction of optimism, provided always that such optimism is not altogether unjustifiable, is to be fostered, for its favorable effect on the patients' psyche, if for no other reason. We turn, therefore, with pleasure to the recent efforts to extend the limits of recovery in hemiplegia. It has been generally held in the past that, following the hemorrhagic insult, there was a paralysis affecting all the movements of one side, next an improvement, progressing in some cases to an almost complete recovery, while in other cases there was very little change for the better.

It is pretty generally agreed that after a time, varyingly stated as six months, one year, a year and a half, etc., we must look upon the *status quo* as the maximum of improvement. Thus many cases seem after a year or so to be doomed to complete hemiplegia, monoplegia, or perhaps contractures or athetoid movements.

But lately the gloom of this picture has become illumined by rays of hope. It has been asserted that, in a great many of these long-standing cases, there is a possibility of great improvement, amounting in some instances substantially to restoration of function. This theory, once evolved, was apparently proved with monkeys, and then extended to human patients, where encouraging results have been reported.

To review a typical case, we have first the rupture of a cerebral vessel with hemorrhage into the cortex, destroying part of the brain tissue. [Unfortunately it is all too frequently in the internal capsule.—ED.] Not to go too exhaustively into the pathology, we will say that there is an extravasation of blood over the motor area, causing a hemiplegia. Later on, with the absorption of the blood-clot, much of the pressure is removed, and the individual synchronously recovers part of the function of the affected side. There remains, however, some actual destruction of cerebral tissue which is not and cannot be replaced, and which fixes a limit to recovery unless we are to suppose one of two things: a compensatory adaptation of other areas on the same side, or an assumption from the sound side of attributes of the diseased side—a rather incredible hypothesis.

Whether or not either of these things occurs cannot be definitely stated at this time. Certainly it has been demonstrated that cases of several years' standing can be taken in hand and by reëducation be given back a large amount of function supposedly lost. This may, of course, be due to the fact that hemiplegics from one cause or another do not always obtain treatment *secundum artem*. Either the patient neglects medical advice entirely after the first shock, or he neglects the massage and use of the affected side, which is so necessary.

The result is a limb only, we will say, about 30 per cent potent, the 70 per cent subnormality being 20 per cent actual destruction of cortical tissue and 50 per cent neglect. Now if we take such a patient in hand we can get back the 50 per cent of use, making the limb useful to 80 per cent of its normal, which contrasted with the former condition seems almost like recovery. But it is not really recovery, and what has really been done has been to show that the limit of recovery has hitherto been unnecessarily restricted.

THE TREATMENT OF ECZEMA IN CHILDHOOD.

To the *Boston Medical and Surgical Journal* of January 3, 1918, WHITE contributes a paper, and after detailing a large number of case histories states that after three years of concentration on the subject of eczema and of working and pondering over one positive and two possible accessories to our therapeutic armamentarium, he feels justified in making the following deductions:

1. There are two great types of eczema—those curable in the hands of an expert and those which resist even the most scientific care. These two classes cannot be distinguished objectively.

2. Crude coal tar when properly used is curative in the majority of instances of moist eczema, and has proved of inestimable value.

3. There is no doubt that eczematous individuals, both young and old, react positively in decided numbers to the food tests and stool examinations—in fact, White has seen among the children treated by him 66 per cent of positive food tests and 81 per cent of abnormal stools. Therefore, he does not hesitate to say that food plays some rôle in the abnormal composition of individuals afflicted with chronic, rebellious eczema.

4. Proper feeding, as indicated by food tests and stool examinations, is capable in very young children (who eat elemental food) of producing a cure or paving the way for a cure in a decided majority of cases.

5. In older children and in adult life the same successful results have been obtained only in a small majority of the cases; but it is possible that this failure is due less to the value of this same knowledge than to the fact that the food of this class of patients is practically always a complex substance and hence incapable of such scientific and exact preparation as is possible in the comparatively simple modification of milk. Until, therefore, we are able by means of special diet kitchens, let us say, to synthesize the food of older children and adults, we cannot hope to make use of these two modern therapeutic adjuncts in our fight against unamenable eczema.

THE MANAGEMENT OF THE CARDIOPATHIC CHILD.

ROST in the *Archives of Pediatrics* for December, 1917, reminds us that in chronic cardiac disease the little patient is frequently sent from school with a note to the parents that the child has a weak heart and must have a tonic. In the routine examination we find a considerable number who have murmurs, at the apex most frequently and at the base, but rarely with no other evidence of disturbed cardiac activity. These children require no treatment for their hearts; we must, however, look after their defective teeth, infected tonsils, and general hygiene, and have their homes visited to note their home surroundings and instructions given as to their proper care. It is only when these children develop an acute infection, rheumatic or otherwise, or when they present signs of decompensation, that treatment is instituted.

A number of these chronic cardiac cases suffer from reinfection with the rheumatic toxin, which has a predilection for the cardiac musculature, and as a result the left ventricle gradually gives way and the patient passes into the more serious class of cases, that in which signs and symptoms of cardiac failure appear. These symptoms vary greatly in different individuals and

are practically the same as in adults: dyspnea, precordial pain, tiredness, insomnia, enlarged liver, edema, ascites, pallor, oliguria, and cardiac dilatation; all are of grave import for the reason that the left ventricle is especially liable to give way under the burden owing to the progressive invasion of the disease. However, a good deal can be done at times to build up the heart functions and make the patient comfortable. In mild cases with slight symptoms a change in the habits or in the amount of exercise may bring about an improvement. In more severe cases absolute rest in bed for a long time may be imperative, careful regulation of the diet and the bowels, and absolute quiet are all essential for the maintenance of comfort. When cyanosis is marked, venesection may be at times life-saving; oxygen, nitroglycerin, and atropine are helpful in some cases.

Cardiac stimulants are of little value when the cardiac failure has been a long time developing and where the muscular degeneration has been progressive; one is more apt to get response from cardiac stimulation where the weakness is only temporary; here whisky, strychnine, caffeine, nitroglycerin, atropine, aromatic spirits of ammonia, and camphor are useful. All of these remedies have only a temporary action and help tide the patient over a critical period. In certain cases in which the renal function is also disturbed the administration of forty to fifty grains of diuretin, in combination with two to three grains of sparteine sulphate daily in older children, seemed to Rost to be of service; theocin in three- to five-grain doses may also be tried.

We now come to the mainstay of cardiac therapeutics—digitalis. According to the observations of Mackenzie this drug exerts its greatest influence in auricular fibrillation; this condition is rare in childhood, for Lewis reports that in 116 cases collected by him only four were under twenty years of age.

Sutherland states that the most striking results are obtained in cases of disordered rhythm in which a slower heart action is desirable, and owing to the fact that irregularities are much less common in association with organic heart disease in childhood, one may readily understand why the range of digitalis therapeutics in early life is limited. Although this may be true to a certain extent, yet Rost would feel that he had neglected the patient and disregarded the careful clinical observations of over fifty years' duration by one of our ablest clinicians if he did not administer digitalis in good-size doses, particularly where the patient presents signs of edema, oliguria, and rapid pulse. In the few cases that Rost has observed, this drug in appropriate dose seems to have been of service. In the administration of this drug we must be careful to obtain it in fresh solution and give it in sufficiently large enough dosage to produce results. If after seventy-two hours no appreciable improvement is noted, it is advisable to make a change. The earliest manifestation at times of the activity of digitalis is an increase in the urinary output. It should be remembered that children and young adults tolerate this drug well; occasionally, when indicated, the addition of nux vomica will lessen the tendency to stomach upset. A careful record should be kept, and as soon as the urine is increased or the pulse-rate diminished the dose of digitalis should be reduced; it is by this means Rost believes that the so-called cumulative action of the drug will be prevented.

INDIGESTION.

In the *Practitioner* for January, 1918, RANKIN well points out that the dietetic treatment of both forms of indigestion aims at minimizing the tendency to gastrointestinal fermentations, and of counteracting, as far as possible, the toxemic intoxications which accompany, in greater or less degree, every case. Similarly, whatever medicinal plan of management is adopted, it ought to aim at fortifying the dietetic restrictions, by disinfecting the gastrointestinal tract, and by assisting nature to restore to a normal condition all the tissues and secretions concerned in the

maintenance of a healthy and harmonious functional activity. In cases belonging to the tonic variety of the disorder, the leading indications are to lessen the amount of gastric secretion and soothe the stomach mucous membrane; to steady the nervous centers; and to control microbic activity in the intestinal tract by suitable disinfectants. A combination of drugs, according to the following formula, aims at accomplishing these requirements:

Ext. valerianæ, gr. ij;
Acid. carbol, pur., gr. ij;
Sodii arsenitis, gr. 1/40;
Codeinæ, gr. ¼;
Pil. rhei co., gr. jss.

Ft. capsul. One to be taken three times a day after meals.

In order to counteract the hyperacidity, a powder like this should be provided:

Magnes. carbon., gr. x;
Bismuthi subcarbon., gr. xxx;
Sodii bicarb., gr. xxx.

Ft. pulv. One to be taken when there is heartburn.

Also, in order to provide for the correction of hepatic inadequacy, which is a constant accompaniment, an antibilious pill is required for occasional use, such as the following:

Hydrargyri chlor. mite, gr. j;
Ext. colocynthidis, gr. iij;
Ext. belladonnæ, gr. ⅛;
Ext. colchici, gr. ⅓.

Ft. pil. One to be taken once or twice a week at bedtime.

A tablespoonful of liquid paraffin, taken once a day, serves to lubricate the bowel, and a simple saline, of which there is none more efficient than Rubinat water, ought to be taken in the early morning according to requirements.

In the atonic variety of the disorder, the same considerations ought to guide the treatment, but the drugs employed require to be modified to suit the special conditions. In these cases the gastric secretion is diminished, and presumably poor in quality, the muscular vigor of the stomach-wall is feeble, and there is a decided lack of nerve energy.

Here the indications are best met by a mixture such as this:

Papain, drachm ss;
Acid. hydrochlor, dil., drachm iij;
Glycerini acid. carbol., drachm ij;
Liq. strychninæ, drachm j;
Codeinæ, gr. iv;
Aq. chloroformi, ad oz. vj.

One tablespoonful to be taken in half a sherry-glassful of water two hours after each meal.

In extreme cases, it is sometimes more satisfactory to replace the strychnine in the above mixture by calumba or gentian, and to administer the strychnine separately by hypodermic injection twice daily.

The pill suggested for use in cases of the tonic type will also suit here, but the colchicum may be omitted. Both paraffin and Rubinat water ought to be used in a similar manner.

When improvement has set in, and the digestive processes are being carried on so satisfactorily that a more liberal dietary can be dealt with; when sleep is better at night, and less disturbed by dreams and nightmares; when the nervous system has become more energetic; and when the mental condition is more hopeful, a change of medication is desirable in both forms of the disorder. In tonic cases, a combination of small doses of one or other of the bromides with glycerophosphates is often successful. This may be conveniently administered according to the following formula:

Sodii sulphocarbolat., drachm ij;
Potass. bromidi, drachm iij;
Syr. glycerophosph. co., ounce jss;
Aq. cinnamoni, ad oz. vj.

One tablespoonful, in water, three times a day, after meals.

In atonic cases the following-on medicine should be somewhat different, because the general tone of the body is always poor, and requires all the help that can be given from drugs likely to build it up. The following combination is generally efficacious:

Ferri redacti, gr. j;
B-naphthol, gr. iij;
Strychninæ sulph., gr. 1/40;
Codeinæ, gr. ¼;
Pil. asafœtid., gr. ij.

Ft. capsul. One to be taken three times a day after meals.

After these capsules have been taken for such a time as seems necessary, they may be succeeded by a more potent form of iron, and, as a rule, no more satisfactory mixture will be found than the old mistura ferri aperiens, which should be taken in periods of three weeks' duration, with one week's interval, until convalescence is completely restored.

In patients with a rheumatic family history, 10 grains of acetylsalicylic acid, taken at bedtime, will help to counteract the inherited tendencies, and to promote sleep. In other cases, in which insomnia is a predominating experience, 7 grains of medinal, or 10 grains of chloretone, or 20 grains of chloralamide, taken for three or four nights in succession, and preferably swallowed with a tablespoonful of brandy or whisky in hot water, will often restore a satisfactory habit of sleep.

TREATMENT OF WHOOPING-COUGH BY VACCINES.

GRAY states in the *Practitioner* for January, 1918, that during the last two and a half years she has been trying the effect of vaccine in the treatment of pertussis. Having found the results satisfactory, she thought a few notes might be of interest to those who undertake the domiciliary treatment of whooping-cough or to those interested in the reduction of infant mortality, which pertussis, with its complications, tends to raise.

Gray has employed three different vaccines, either alone or with the addition of drugs such as antipyrin, belladonna, bromide, or garlic, and has found that the cases treated with vaccine have shown decided improvement after the injection. The first vaccine Gray used was the stock preparation of Parke, Davis & Company, which contains 250 million Bordet bacilli and 10 million pneumococci per Cc. The second was one which Gray had had prepared by the same firm, and contained 250 million Bordet bacilli per Cc. without the addition of any pneumococci, and this is the preparation which she found most satisfactory in reducing the paroxysms, lessening the vomiting, and tending to the most rapid recovery with disappearance of the characteristic whoop. The third vaccine was the "pertussis vaccine" supplied by the New York Health Department. This Gray was able to use in only six cases; but she did not find the results so satisfactory as in the case of vaccine No. 2. This may be due partly to the preparation not having been fresh, and partly to the small number of cases on which Gray had the opportunity of testing its value.

All those to whom Gray administered this treatment were in-patients in different hospitals, and were, for the most part, very debilitated, badly nourished, underfed children of six years and under, so the results are all the more worthy of note.

During the year 1914-15 the chief line of treatment which Gray adopted, in addition to fresh air, good food, and other hygienic methods, was the employment of the usual sedative drugs, bromide, belladonna, antipyrin, etc.; but, in spite of every care and attention, the paroxysms did not seem to get any less frequent, and the disease ran its course, which was generally a prolonged one, accompanied in many cases by a more or less severe bronchopneumonia. The first time Gray employed vaccine No. 1 was as a last resource, and the result in this case was so striking that she resolved to try it on further cases of whooping-cough. In all, over thirty cases had vaccine injections, and a night and day chart was kept on which were registered the date of vaccine administration and the number of times that the cough, whoop, vomiting, or blood was present. The records showed a gradual decrease in the symptoms corresponding with the vaccine administrations. The few cases which did not respond well to the vaccine came to hospital in a condition too feeble to give any reaction except a negative one, or were complicated by some intercurrent malady such as tuberculosis or some superadded infectious disease.

An interesting note was made of the case of two sisters admitted the same day. The one received an injection on the third day

after admission, and the other had none till a few weeks later. They both had sedative cough mixture from the time of admission, but there was no steady improvement till after the vaccine had been employed.

NITROUS OXIDE AND OXYGEN IN OBSTETRICS.

In the *West Virginia Medical Journal* for January, 1918, FLEMING details his favorable experiences with this method and states that the technique of administration is as follows:

Two machines are used—a Gwathmey apparatus, having an ether attachment, is kept in the maternity department of the hospital and requires a trained assistant for its use. A smaller, portable, automatic machine is used in outside work which Fleming uses personally until time to examine or deliver, when he turns it over to a trained obstetrical nurse or even to the patient. The intermittent method is always used, employing a mixture of nitrous oxide and air, ending if necessary with nitrous oxide, oxygen, and ether for operative deliveries. The administration is usually begun during the latter part of first stage or during the second, being governed in this respect by the severity of the pains and the condition of the patient. The operator requests the patient to tell when she feels that a contraction is beginning, he also watching for this with a hand on the fundus of the uterus. Herein lies the success or failure of the method, as it is essential that the gas be given before the contraction is really appreciated as a pain. The mask is quickly applied and the patient told to take deep and rapid breaths. The number of inhalations necessary to produce analgesia varies with different individuals. Some will gain relief with from three to seven inhalations, while in others the gas must be given throughout the contraction. Cyanosis is to be avoided, and any tendency to blueness or drooping of the eyelids indicates that too much gas is being used and that the patient is passing from analgesia into anesthesia. At the end of a pain, if necessary, a few whiffs of oxygen may be given, which rapidly freshens the patient.

As the end of the second stage approaches, a little more gas is given during each contraction until, during the expulsion stage, the patient is carried into obstetrical anesthesia, if necessary, with the aid of ether. However, without the aid of ether. Fleming has been able to make several forceps extractions, and the gas-oxygen alone is quite sufficient to enable one to perform an episiotomy, although its repair usually requires the addition of ether. Fleming is not sure but that the use of ether during the last few inhalations, before the actual delivery, gives the operator better control of the delivery and gives the patient absolute relief and absence of any memory of the actual birth of her baby. Ether given in this manner does not nauseate the patient and she awakens quickly.

The most pleasing and striking thing in this series of cases has been the manner in which these patients, who had been complaining of pain, and in some cases very excitably, rapidly became quiet when analgesia was begun, remaining so throughout their labor. Fleming believes that fear is productive of pronounced shock and exhaustion, and that fear and pain are doubly shocking. In some of these cases, therefore, with a partly dilated cervix and an exhausted patient, the outcome would certainly have been mid or high forceps with the accompanying danger to mother and child.

In one of the cases the child was born markedly cyanosed, with the cord around the neck. In this case the cord was not cut immediately, and the mother was allowed to breathe pure oxygen for a few minutes as advised by Danforth, which soon revived the youngster.

It is an accepted fact that asphyxia, by whatever cause produced, will cause hemolysis. It must also be accepted that any anesthetic given to the degree of producing loss of consciousness must produce certain changes in cell structure and that hemolysis may be expected after anesthesia regardless of the agent used, but especially after the

use of slowly eliminated anesthetics improperly administered. With this information Fleming believes that nitrous oxide with oxygen, properly given, is less likely to produce hemolysis than ether or chloroform. The old belief that "chloroform has no bad effects upon a woman in labor" is so foolish that it is not worthy of consideration.

DeLee believes that the use of nitrous oxide for longer than three hours carries with it danger of hemolysis, but certainly this is more true of chloroform, and as our technique improves and by carefully following the intermittent method Fleming is sure that the length of administration of gas-oxygen can be extended. The longest time of administration in his cases was three hours and twenty minutes; the shortest, twenty minutes.

Some obstetricians object to this method of analgesia in obstetrics, believing that fatal asphyxia and hemorrhagic disease is more common following its use. Fleming believes that this objection may be met by the following: When the uterus contracts, the circulation on its walls is, for the time being, normally lessened so that when the maternal blood contains the most nitrous oxide, *i.e.*, during contractions, only a small portion can reach the child, and by the time the contraction ceases the blood is being freed from gas and rapidly reoxygenated by allowing the mother to inhale pure oxygen.

Another objection, which is a poor one, is the increased cost which the patient must bear. Personally, Fleming places obstetrics and major surgery on the same plane, for obstetrics is a very special kind of major surgery, worthy of the dignity of major obstetricians. Fleming's fee for obstetric attention and surgical attention are the same. He finds that it requires more skill for him to give a woman proper attention in confinement than it does to remove her appendix; hence, he at least makes the fee equal.

In conclusion, he might say that his experience and the experience of his associates have been very satisfactory. The result in these cases which has been of most value is the marked freedom from mental and physical exhaustion which these patients have after the use of nitrous-oxide analgesia. Their gratitude is lasting.

ENTAMŒBA HISTOLYTICA INFECTIONS.

MacAdam in the *Lancet* of January 5, 1918, wisely emphasizes the point that the present therapeutic measures which are recognized as efficient in the treatment of acute amebic dysentery have not proved of similar service in the elimination of the entameba and its cysts from the intestine.

It is now recognized that hypodermic courses of emetine are not sufficient to rid carriers of their infection. This is borne out by an analysis of some of MacAdam's figures. A comparison was made between the number of emetine-treated cases among the histolytica carriers who gave a history of dysentery, but had not recently suffered from the disease, and among the emetine-treated dysentery convalescents. Out of the 49 carriers with a more or less remote dysenteric history it was possible to obtain details in 44 cases, and of these only 7 had had emetine at some time or other; while of the 38 patients recently discharged for and "cleared" from dysentery, a record was obtained in 35 cases, and all except 5 had been on emetine treatment of varying amounts. As these two sets of carriers formed 19.9 per cent and 19.4 per cent of the total number of men examined in their respective classes, it does not appear as if emetine had had much effect in diminishing the persistence of those cystic infections. Of course, it must be admitted that in many instances emetine appears to have been administered in a somewhat casual fashion, frequently in a 4- to 6-grain course at a time, and very few of the cases appear to have had a continuous course of 12 grains given one grain daily for twelve consecutive days, nor is there any record of oral administration of ipecacuanha or emetine. Still, a certain number of those men who have had 10 to 12 grains of emetine hypodermically, 20 grains in some

instances, occurs in this batch of carriers, so that MacAdam's deductions are in agreement with the consensus of opinion that the hypodermic administration of emetine alone, although immediately alleviating the dysenteric symptoms, tends only in a small degree to reduce the persistence of histolytica infections.

Treatment with emetine bismuth iodide is still on trial, as is also the combined oral and hypodermic administration of emetine, for, in MacAdam's opinion, in recently published records of the effects of various modes of treatment certain important factors have been altogether ignored, which, according to his observations, must be considered in any test of the therapeutic value of drugs for the "curing" of histolytica carriers.

THE ADMINISTRATION OF LARGE DOSES OF QUININE AND ADRENALIN BY HYPODERMOCLYSIS IN THE TREATMENT OF MALARIA IN TROOPS.

The *Lancet* of December 29, 1917, quotes Professor U. Pende, of the University of Palermo, who has used for more than ten years a method of treating malaria which he strongly recommends as effecting both a "therapia magna sterilisans" and an economy in the use of quinine. Subcutaneous or intramuscular injections have frequently failed to triumph over the infection even in doses of one gramme repeated daily for 20 to 30 days, whereas Professor Pende's method, which has nothing to lose in comparison with the intravenous by way of rapidity and certainty of action, has the advantage of being able to introduce into the circulation a larger quantity of quinine without any danger, and thus of paralyzing to the utmost the vitality of the most resisting forms of parasite, even when entrenched in the depths of the various viscera.

The method consists in a hypodermoclysis, repeated every five or six days for four or five times, of 250 grammes of physiological salt solution, to which are added two grammes of bihydrochlorate of quinine, and half a cubic centimeter of 1-in-1000 solution of adrenalin. The technique is very simple, the middle of the anterior external part of the thigh being selected as the most favorable site for the injection, and the fluid, being held about 6 feet above the leg, penetrates the tissues in ten to twenty minutes and causes no pain. Absorption is rapid, as the drug can be detected in the urine about an hour afterward. The first injection is given, if possible, six or seven hours previous to an attack, and is followed by a second in 15 to 24 hours; on the fifth to sixth day a third is given, and after a further five or six days a fourth, always in the same dose of 2 grammes, equivalent to 1.60 grammes of pure alkaloid. A week after the fourth injection quinine is given by mouth in doses of 2 to 3 grammes a day in six to nine powders, for two days in succession every week for a couple of months, arsenic and iron being given on the intervening days. The effect of the treatment is that in the majority of cases the temperature falls completely, sometimes with a rapidity very striking in severe forms which have resisted previous treatment by quinine by the mouth or ordinary hypodermic injection. Sometimes there is a modified abortive attack one or two days after the second hypodermoclysis, followed by complete apyrexia. After about three months a perfect clinical cure results.

Professor Pende considers that the results would be still better, and reduce to the minimum the probability of relapses, if the treatment could be always applied in the initial attack of a malarial infection—that is, before the formation of quinine-resisting gametes. There appear to be no contraindications to these heroic doses of quinine in subjects free from organic disease of the circulatory system or kidneys. No traces of albumin are to be found in the urine, while the addition of adrenalin serves to counteract vasomotor collapse which might be apprehended from such large doses of the alkaloid in subjects specially predisposed to vascular atony.

THE ADMINISTRATION OF BROMIDE.

CRAIG writes to the *Lancet* of December 29, 1917, to the effect that for many years he has been prescribing potassium bromide in very small doses, and he has found a small dose such as 5 grains once a day long continued far more efficacious than larger doses for shorter periods. In functional nervous disorders, such as neurasthenia and nerve exhaustion, and in traumatic neurasthenia, reflex irritability is one of the earliest symptoms, and as this irritability increases, so the personality of the patient becomes more and more disturbed. Now if it is possible to control this irritability, the patient may rapidly improve and may continue to work with comparative comfort. Craig has found from long experience that 5 grains of potassium bromide once a day will control this reflex irritability. The smallness of the dose avoids the depressing effect of the salt, and it may be taken with great advantage for many years during the active business or professional life of the individual.

On finding the value of these small doses in controlling hypersensitivity and irritability in adults, it occurred to Craig that still smaller doses might be of value in childhood, and the results obtained have been equally satisfactory. The excitable and irritable child wears itself out, and as it grows further nervous and mental symptoms develop. For example, many persons, including children, who develop epilepsy have passed through one or more years of increasing nervous excitability. Correct this irritability and the epilepsy is prevented. That this is true Craig has proved in many cases; for example, he has prescribed one daily dose of 3 to 4 grains of potassium bromide for a child whom he regarded as a potential epileptic, and gradually the irritability would disappear; the dose was then discontinued under the usual belief that it was harmful to continue for any length of time, and slowly the symptoms would recur and finally culminate in an epileptic seizure. A physician need have no hesitation in keeping an excitable or nervous child on a trifling dose of bromide throughout the greater part of his school days. The potassium salt is undoubtedly more efficacious than the other salts and is not depressing in small doses, in the opinion of Craig. It is true that some cases of nervous exhaustion require larger doses to begin with, but it should be the aim in these cases to reduce the dose as soon as possible and then continue for years if necessary. The reason Craig recommends continuing for years is that once a person suffers from nerve exhaustion he will always tend to get a recurrence of his symptoms with stress and mental strain, and Craig finds that small daily doses of bromide are a great protective. He has never known a person suffer from taking bromide in this way, but, on the other hand, he believes that it is only too common to see patients suffering from the want of it.

THERAPEUTIC EXPERIMENTS WITH ROSENOW'S ANTIPOLIOMYELITIC SERUM.

The *Journal of Experimental Medicine* of February 1, 1918, contains an article by AMOSS and EBERSON in which they point out that the injection intracerebrally into monkeys of minute quantities of an active virus of poliomyelitis is followed by paralysis and, as a rule, by death of the animal. The injection of far greater quantities of the same virus into the blood stream produces no symptoms. If, however, as Flexner and Amoss have shown, the meninges and choroid plexus are chemically inflamed by a simultaneous or previous injection of sterile horse serum, monkey serum, or even isotonic saline solution, the virus is enabled to pass from the blood into the nervous tissues and thus to induce the characteristic changes which lead to paralysis and even to death.

The same authors found only one substance which, when injected intraspinally, prevented the localization of the virus in the nervous organs after intravenous injection, and that is the serum derived from monkeys which have survived a poliomyelitic infection. Moreover, this serum is

capable of setting aside the effects of the chemical inflammation incited by horse serum or other foreign fluids injected intraspinally. In other words, when the immune convalescent serum is introduced into the meninges in animals previously injected intraspinally with horse serum or other fluids mentioned, followed by an intravenous injection of the virus, no paralysis or other evidence of infection results. This experiment gives such decisive and unequivocal results that it seems particularly adapted to determine the therapeutic value of a serum or other product reputed to be effective in the treatment of poliomyelitis in man.

Two series of experiments are described in which Rosenow's antipoliomyelitic serum, so called, has been compared with the immune serum derived from monkeys which have convalesced or recovered from experimental poliomyelitis.

The experiments consisted in introducing an active virus of poliomyelitis into the blood and of injecting the two kinds of serum into the cerebrospinal meninges according to the method of Flexner and Amoss.

Under the conditions of the experiment, the control monkeys (*a*) receiving the virus intravenously alone do not develop paralysis, while those (*b*) receiving the virus intravenously and normal horse serum intraspinally develop paralysis. Moreover, the monkeys (*c*) receiving the virus intravenously and Rosenow's antipoliomyelitic serum intraspinally develop paralysis in the manner of those receiving normal horse serum intraspinally. The monkeys (*d*) which received the virus intravenously and the convalescent or immune monkey serum intraspinally alone did not develop paralysis.

The Rosenow serum acts in the manner of normal horse serum; it promotes the passage of the virus of poliomyelitis from the blood into the nervous organs, and it does not protect from infection.

Amoss and Eberson have found that Rosenow's serum under the conditions of the tests is effective therapeutically in monkeys or possesses antibodies of the same nature as those present in the blood of monkeys which have recovered from experimental poliomyelitis.

Since the antibodies in convalescent poliomyelitic serum in man and the monkey are identical, it follows that any antibodies present in the Rosenow horse serum do not conform to those occurring in human convalescent serum.

THE TREATMENT OF ECLAMPSIA.

In the course of an article in the *Memphis Medical Journal* of December 1, 1918, ANDREWS admits that so far as etiology is concerned, eclampsia is a condition of mystery and theory. So far as the practical management is concerned, possibly no pathological condition presents as little mystery and uncertainty. It is really possible to outline plans of management for most phases of the condition, plans which should be most satisfactory, *if rigidly carried out.* So far as the treatment of eclampsia is concerned, one can really afford to be dogmatic.

For purposes of clarity and brevity, some of these dogmatic rules may be stated at the outset:

1. Veratrum viride will control convulsions, especially antepartum convulsions, at least until measures for cervical dilatation and delivery can be carried out. This drug is almost a specific for this particular purpose. It is the experience of those who see a considerable number of cases from time to time that either the profession does not realize the importance of this drug, or that its use is not considered advisable.

2. With convulsions of any degree of severity, steps looking toward delivery must immediately be instituted. This is the law of the Medes and Persians, never under any circumstances whatever to be violated. This is a sad obstetrical picture—a woman who has had convulsions for any length of time with a rigid os.

3. Most of the books state that convulsions frequently soften and dilate the cer-

vix. This is most certainly not the experience of Andrews. Some of the most rigid cervices he has ever seen have been in eclampsia. The cervix really seems to share in the general condition of rigidity and lack of relaxation.

HEART FAILURE AND PREGNANCY.

MACKENZIE in the *Lancet* of January 12, 1918, asserts that the part played by murmurs in relation to heart failure is limited to the fact that the presence of a murmur may indicate occasionally that the heart has been damaged by some process. As Mackenzie has said, such murmurs are few and practically limited to those characteristic of mitral stenosis and aortic regurgitation. It follows that the great majority of systolic murmurs in whatever area they are heard throw no light on heart failure, and are of no significance. In the few instances when they may be helpful as evidence of a damaged valve the final decision will depend upon the manner in which the circulation is maintained.

Heart failure is essentially a question of myocardial efficiency. Mackenzie is accustomed to describe the force possessed by the cardiac muscle as of two kinds: a force which maintains the circulation when the body is at rest—the rest force; and a force called into play when effort is made—the reserve force. Heart failure begins by the diminution of the reserve force, and is made manifest by a limitation of the power of the heart to respond to effort. All failing hearts show a limitation of the field of cardiac response—the first sign being the patient's consciousness that certain efforts which he used to undertake with ease and comfort now give rise to distress. But healthy hearts may show these signs when there is the added burden of pregnancy, for the condition then resembles an individual undertaking an effort with an impaired heart. It is necessary to bear this point of view in mind, because many practically healthy hearts burdened by pregnancy show distinct signs of inefficiency, and yet there is no danger. The notion that the left ventricle hypertrophies to meet the burden of pregnancy is not based upon trustworthy evidence. What does happen in every woman is a limitation of the heart's power to respond to effort—a diminution of the reserve force, greater in some cases than in others. A careful investigation which Mackenzie carried out in 100 women before pregnancy, during pregnancy, during confinement, and the puerperium, showed no evidence of that hypertrophy which is supposed to meet the increased demands, for the increased demands were only met by calling upon the reserve force. As the growth of the abdominal tumor proceeded the diaphragm was pushed up, the sides of the chest widened, and the heart was displaced upward and to the left, so that the apex beat was frequently felt in the fourth interspace outside the nipple line. With the emptying of the uterus the heart shifted to the normal position.

It is necessary to bear these facts in mind when the question arises how to deal with a woman who has become pregnant and who is supposed to have some heart failure.

While the exhaustion of the reserve force gives rise to the same symptoms whether it is a healthy heart overburdened or a heart failing from disease, it is the extent to which the signs of cardiac inefficiency go and the progress of the failure which serve as a guide. The most striking phenomena of the progress of heart failure are the onset of dropsy, breathlessness gradually increasing till the patient has to sit up, edema of the lungs, and persistent increase of rate or violent beating of the heart on exertion.

In regard to dropsy there is this to be remembered, that it frequently occurs in pregnancy from other causes than heart failure—in kidney affections, and from pressure of the uterus upon the abdominal veins. When it is present it must not of itself be taken as an indication of a failing heart, but only when there are present the other symptoms of heart failure. It is unnecessary to insist upon orthopnea. When

this stage is reached in heart failure the sooner premature labor is induced the better. Edema of the lungs is probably the most reliable guide. When carrying out his investigations it was Mackenzie's custom to begin the examination of the patient by finding out on which side she lay, and then get her to sit up, and auscultate the base of the lung on that side. In many healthy women he found during the later stages of pregnancy that the first deep inspiration was accompanied by numerous crepitations, and that the inspiration dispelled them, so that they were not heard after. In cases that did badly these crepitations did not disappear, but tended to persist, so that their continued presence, coupled with an impaired percussion note, is such a grave sign as to indicate the need for terminating the pregnancy.

Termination of the pregnancy is indicated in mitral stenosis when edema of the lungs persists in spite of sitting up in bed or when the heart-rate is persistently over 100 with violent palpitation on the slightest effort. The dangers in aortic regurgitation are so great and yet so difficult to anticipate that Mackenzie would recommend the termination of pregnancy in all cases with a "Corrigan" pulse, and when there is a distinct forcible apex-beat outside the nipple line.

THE EFFECTS OF TOBACCO ON CIGAR WORKERS.

In the *American Journal of the Medical Sciences* for February, 1918, MILLER concludes a study of four hundred cigar workers as follows:

1. The literature upon the effect of working in tobacco favors the view that it predisposes the worker to pulmonary tuberculosis, gastrointestinal disturbances, anemia, genital abnormalities, and nervous conditions.

2. In the study of the social and medical conditions of 400 cigar workers in Philadelphia Miller did not find support for any of these contentions.

3. He did find, however, some wearing of the teeth and some pharyngeal and conjunctival congestion, findings which he believes to be dependent upon faulty personal and factory hygiene.

PNEUMONIA.

In the course of an article in the *Journal of the American Medical Association* of February 9, 1918, an anonymous contributor points out that workers in the Rockefeller Institute have prepared antipneumococcus serums, and that these serums against infection with the Type I organism appear to have produced especially good results, and to be highly effective in treatment of cases of pneumonia due to this type. The serum of Type II is much less efficacious, and, indeed, it has not been thoroughly demonstrated whether it has any valuable effect on the outcome of the disease. The serum for Type III organisms has apparently but slight therapeutic power, and has not been considered worthy of use in infections with Type IV pneumococcus. Commercial preparations of these serums are available and also polyvalent serums. These polyvalent antipneumococcus serums are of extremely doubtful value. It has been suggested that polyvalent serum be given until the type of the organism is determined, and that following this, the specific serum for Type I or Type II may be utilized if the infection proves to be of that character. With pneumococci, at least as regards the first three types, the immunity reactions appear to be specific, and for this reason the workers in the Rockefeller Institute do not advise the routine manufacture of polyvalent antipneumococcic serums. In fact, they suggest that for the present the production of antipneumococcic serum should be confined to Type I. It has also been suggested that every pneumonia patient receive, immediately after admission to a hospital, a large dose of antipneumococcic serum of Type I, with the idea that the case may prove to be of that character, and considerable time will be gained.

While cases caused by other types of pneumococci than Type I are not benefited by serum, it is quite likely that they may be harmed. The intravenous injection of a hundred or more cubic centimeters of horse serum can hardly be devoid of harm, and is certainly not to be used except when very decided benefit may be expected to follow its use. Hence the first thing is to determine the sort of bacterium causing the pneumonia in the individual, and if it is a pneumococcus to determine the type to which it belongs. If it is a Type I pneumococcus, serum treatment may be undertaken. The value of the serum in the treatment of pneumonia is uncertain, but the results reported are sufficiently convincing to warrant its further trial under suitable conditions. It should be used only when correct diagnosis of the type of infecting organism has been determined. Under present conditions this can hardly be done, of course, outside of a hospital or in a laboratory which has specially trained workers. The serum may then be used, except in very young children who appear but little intoxicated by the infection, or in adults mildly ill and already showing signs of decreasing fever and intoxication.

Before administering the serum, patients should be questioned as to previous injections of immune serums for diphtheria, meningitis, or for tetanus infections, and also concerning previous symptoms suggesting asthma, hay-fever, or special sensitivity to proteins, including those in serum. It is suggested too that we use the intradermal skin test, injecting first 0.02 Cc. of sterile diluted horse serum, diluted with salt solution 1:10, with injection of a simple salt solution as a control, to learn whether or not the patient is specially sensitive to the serum. If sensitivity is present, the injection of the serum produces a large urticarial wheal surrounded by an area of erythema.

It becomes evident when one views critically the present status of the serum treatment of pneumonia, that it can be properly carried out only in institutions where it is possible to make accurate bacteriologic diagnoses and differentiations of the types of pneumococcus, and where facilities for the intravenous administration of large amounts of horse serum with safety are at hand. Even at best a limited number of cases are suitable for treatment with immune serum, a large proportion of lobar and the very large group of atypical and bronchopneumonias not being susceptible of attack by these measures.

The serum is injected into a convenient vein, usually at the bend of the elbow, the skin being previously cleaned with iodine and alcohol. If there are facilities for making blood cultures, blood may be first withdrawn for this purpose. The serum is injected into the vein with a syringe, or by the gravity method, the injection being done steadily and slowly, the injection of the first 10 to 15 Cc. occupying from ten to fifteen minutes. During this time the patient is carefully watched for symptoms of reaction, such as increased rapidity of the pulse, difficulty of respiration, cyanosis, or urticaria. If no symptoms arise, the remainder of the injection may be completed in from ten to fifteen minutes.

The amount of serum necessary will vary in individual cases. It is generally believed that the dose should be large, perhaps from 90 to 100 Cc. of the standard serum. The specific serum treatment having been begun, it should be continued until a definite favorable result has been obtained, and the serum may be given every eight hours in doses of from 90 to 100 Cc. unless there are contrary indications.

The average total amount of serum required in cases in the hospital of the Rockefeller Institute was about 250 Cc. In many cases an elevation of temperature follows the injection of the serum within from twenty minutes to an hour, and this in turn is followed by a marked fall. If the temperature continues low and the patient's condition is good, no more serum is administered. The temperature is taken every two hours, and if it rises within twenty-four hours to 102° F. or over, a second dose of serum is at once administered. If no fall of temperature occurs following the first

dose, or if it does not fall to 102° F. within eight hours, a second dose of serum may be given. The same rule governs the administration of the third or subsequent doses.

TREATMENT OF ENTAMŒBA HISTOLYTICA "CARRIERS" WITH EMETINE BISMUTH IODIDE, WITH A COMPARISON BETWEEN THE KERATIN-COATED TABLETS AND SALOL-COATED PILLS.

In the *Journal of the Royal Army Medical Corps* for December, 1917, LILLIE and SHEPHEARD give these conclusions:

1. (*a*) That "carriers" of *E. histolytica* who had not had any injections of emetine hydrochloride were cured to the extent of 78 per cent by two courses of the salol-coated emetine bismuth iodide pills. (*b*) In the case of men who had had emetine injections 72.8 per cent were cured by two courses of the salol-coated pills. (*c*) In the case of men who had not had emetine injections 70 per cent were cured by two courses of the keratin-coated tablets. (*d*) In the case of men who had had emetine injections 45.4 per cent were cured by two courses of the keratin-coated tablets.

The difference between the percentages in (*a*) and (*b*) are within the range of experimental error and need not be considered. But in (*c*) and (*d*) the difference is too great to be ignored.

This difference may be due to the variation in the quality of the keratin-coated tablets, but such a defect would be common to both cases which had received injections of emetine and those which had not.

It is generally admitted that certain "carriers" of *E. histolytica* are not cured by emetine in any form, and it may be, as Mr. Dobell suggests, that these cases became segregated in (*d*). It seems possible that the difference in the two percentages may be due to the injections of emetine rendering the "carriers" less liable to be cured by emetine bismuth iodide.

For comparison with the above percentages of cures by a maximum of 72 grains of emetine bismuth iodide carried out in the special ward, the writers give the number and percentage of cures in the other wards of their hospital.

The number of grains of emetine bismuth iodide which these cases received varied from 36 to 200. A case was regarded as cured after not less than five negative examinations over a period of not less than five weeks after the end of treatment. The last test was made at the Barton Convalescent Depot. Out of 160 cases treated 142 were cured—*i.e.*, 88.7 per cent.

2. There is no evidence that the length of time between the dates of onset of dysentery symptoms and the treatment has any effect upon the chances of cure by emetine bismuth iodide.

3. There is no ground for the belief that the vomiting diminishes the chances of cure by the emetine bismuth iodide treatment. There is nearly as much vomiting among the cases which are cured as among those which relapse.

4. The age of the patient has no effect upon the chance of cure by the drug. But there is evidence to show that men over forty years of age vomit less while undergoing treatment.

5. The salol-coated pills are a distinct improvement upon the keratin-coated tablets from a curative point of view. They also cause less vomiting and loss of weight.

PREGNANCY AND PULMONARY TUBERCULOSIS.

In the *Journal of the American Medical Association* of February 9, 1918, NORRIS and LANDIS after an exhaustive consideration of this topic reach these conclusions:

1. The combination of pregnancy and pulmonary tuberculosis is a frequent one.

2. Pulmonary tuberculosis exerts little or no influence against conception.

3. Pulmonary tuberculosis exerts but little influence on the course of pregnancy, and except in the advanced stages exerts little or no influence toward causing abortion, miscarriage, or premature labor.

4. About 20 per cent of mild, quiescent pulmonary tuberculosis and 70 per cent of more advanced cases exhibit exacerbations during pregnancy or the puerperium.

5. Marriage is worse for tuberculous women than for tuberculous men, owing to the dangers incident to pregnancy.

6. Unless the pulmonary lesions have been quiescent for a moderately prolonged period, tuberculous women should not marry.

7. Tuberculous women should not become pregnant unless the disease is in the first stage, and has been quiescent for a minimum period of two years.

8. It is as yet impossible to determine with certainty which patient will bear the added strain of pregnancy well and which badly. We must individualize our patients. Moderately extensive lesions, recent activity, the development of secondary lesions, especially laryngeal involvement, loss of weight, fever, hemorrhage, sweats, lack of vigor, and inability to obtain proper treatment are ill omens, whereas the reverse are more favorable.

9. Prior to the fifth month of pregnancy, the uterus should be emptied if the disease manifests evidence of becoming active, or if the lesions are extensive ones or laryngeal involvement occurs. Curettage during the first six or eight weeks, and in the latter cases vaginal hysterectomy, are as a rule the preferable methods. Interruption of pregnancy does not insure an amelioration of the pulmonary condition, but does definitely improve the prognosis. About 65 to 70 per cent of patients, prior to the fifth month of pregnancy, will be definitely improved by the emptying of the uterus as soon as acute symptoms arise, provided proper after-treatment is carried out. Late intervention has given less satisfactory results. Sterilization is rarely justifiable.

10. After the fifth month of pregnancy it is generally advisable to treat these patients expectantly. Labor should be made as easy as possible. For this end induction of premature labor two weeks before term is often advisable; rarely, if ever, should they be allowed to go beyond term. At labor, forceps or version is usually indicated.

11. Infants should not be nursed by tuberculous mothers, and should be especially guarded from infection.

12. Hygienic and dietary treatment should be employed at all times. These patients should be kept under close observation and should be examined by a competent internist at regular and frequent intervals.

13. In the great majority of cases the tuberculosis precedes the pregnancy. Even in those cases in which the symptoms are first observed during pregnancy, infection has generally occurred prior to conception, and an exacerbation during pregnancy has directed attention to the pulmonary condition.

14. Norris and Landis especially urge that all pregnant women giving a story at all suggestive of pulmonary tuberculosis be subjected to a thorough examination by a competent internist at the earliest possible date. Only in this way can the proper treatment be instigated at the time when it is most valuable.

15. It is doubly important that tuberculous pregnant women shall be given the same care as the non-pregnant person as far as rest, hygiene, diet, etc., is concerned.

ABORTION.

MONTGOMERY in *American Medicine* for January, 1918, tells us that threatened abortion is indicated by pain, the discharge of blood, and frequent contractions of the uterus. The patient should be at once placed in bed and given good doses of morphine, preferably by suppository or hypodermic injection, and should be kept under the influence of the drug for several days. The bowels should be evacuated by enemata or the administration of a saline; rest, physical and mental, should be secured. If the bleeding continues, the contractions increase, and the uterus is dilated, the abortion becomes inevitable. Hemorrhage can be controlled by packing the vagina, and even the uterine canal until the latter is suf-

ficiently dilated to permit the evacuation of its contents. The steps in this procedure should be thoroughly aseptic to avoid the possibility of introduction of infection.

Incomplete abortion, by which is meant the retention of some of the products within the uterine cavity, is a very frequent occurrence, and the question which confronts one is what steps shall be taken to secure the complete evacuation of the uterine contents. If the uterus is open, permitting the introduction of the aseptic finger, the removal of its contents is usually easy. If, however, the uterus has contracted so that it will be necessary to dilate it in order to evacuate its contents, it is much better to take precautions to keep the patient clean, free from possibility of infection, and allow nature to evacuate the uterus. Certainly it is unwise to dilate the uterus for the removal of retained products.

Sepsis in association with abortion is of very frequent occurrence, and it is these cases which give the physician the greatest annoyance and distress. He is confronted with all the fears of the patient and those about her. The elevation of the temperature is regarded by the patient as absolute evidence of the retention of products, and she and her friends are urgent that such products must be removed, and an operation done therefor. Serious symptoms may be due either to sapremia, the putrefaction of retained products, or to infection known as sepsis. In almost every case the patient and her family will be urgently insistent that something in a surgical way must be done. In the former cases the removal of decomposing products may result in immediate subsidence, and in the latter will only open up avenues for the admission of further infection which predisposes to fatal results.

It is a great temptation to institute measures for the exploration of the uterus when symptoms indicating infection follow an abortion, but large experience in the wards of the Jefferson Hospital, where Montgomery has analyzed some 300 cases, has demonstrated that both morbidity and mortality are decreased by a course of judicious inactivity. If we are unable by a curettement, or even the removal of the uterus, to get beyond the infective processes, we are but aggravating the condition. Delay gives more time for the forces of the patient to overcome the infective processes and bring about the destruction of the organism. Premature measures add fuel to the flame and increase the rapidity of the infective processes. *Montgomery emphatically asserts that the uterus should never be forcibly dilated in the early stage of the septic process.*

If operative measures are prohibited it will be asked, "What shall we do?" Absolute physical and mental rest should be secured. By this Montgomery means the patient should be isolated from those who are deeply concerned in her condition. She should be kept in bed and cold applications applied over the abdomen to limit the progress of infection. Where the abdomen is distended and nausea is present proctoclysis of normal salt solution, 30 drops to the minute, should be used continuously. If this is not well retained it is better to elevate the foot of the bed so that gravity will assist in filling the large intestine. Thus superfluous material may be removed by having proctoclysis take place through a two-way tube which will permit the fluid to escape if the intestine becomes overdistended. Such a course facilitates dilution of the toxins in the intestinal tract, more active elimination through the kidneys and skin, and with this the reduction of the body temperature. When the infection results in a localized general peritonitis the proctoclysis should be supplemented by the use of morphine hypodermically, keeping the patient under its influence, and employing gastric lavage whenever the patient suffers from repeated vomiting, or the upper portion of the alimentary canal is distended by tympanites.

In specific cases the preparation of an antitoxin is desirable. This, however, is not always procurable, even though it is evident the patient had bacteremia. The organisms may be situated on the sides of the vessels and outside the blood current,

and thus escape from observation and the bacteriologist be unable to obtain them. In these cases the injection of horse serum will increase phagocytosis and establish early results. The subsidence of temperature and discomfort should be followed by the substitution of heat for the cold as it promotes a more rapid absorption of exudation and the results of inflammatory processes. The patient, however, should be kept strictly at rest until it is evident the active processes have completely subsided. Operative measures should be employed only when it is evident localized foci exist, either in the tubes, ovaries, or sides of the uterus, subsequent to the subsidence of the more active processes. Sacrifices of ovaries, tubes and even the uterus may be necessary for the recovery of the patient, but these procedures should come late in the treatment.

THE TREATMENT OF FRACTURES IN WARFARE.

SIR ARBUTHNOT LANE (*Lancet*, Jan. 5, 1918) calls attention to the fact that in warfare there are not only compound fractures produced by shells and missiles, but many simple fractures; that in his experience during the war no cases have been as badly treated as they. The unsatisfactory results have been due either to a want of familiarity with the mechanics of fracture or to such an imperfect operative technique as suggested but little knowledge of the very important details which a surgeon should employ in operating on fractured bones.

Large numbers of fractures have been allowed to unite in vicious position. Colles' fractures are not reduced, nor the semilunar bone of the wrist. Nor does he believe that there is any possible excuse for these frequent failures since radiography affords every facility for determining the relative positions of the fragments with perfect accuracy at any stage of the treatment. Many surgeons appear to imagine that the very moderate amount of cleanliness which enables them to perform abdominal or other operations with success is sufficient for the methods required to expose a simple fracture, to place the fragments in accurate apposition and to retain them by means of steel plates and screws. In the case of compound fractures produced by projectiles the fragments rarely call for any special treatment other than that continuity of the fragments should be secured as effectually as possible by some method of extension. That employed by Sinclair is regarded as best. He has known many limbs rendered useless by the removal of the fragments, especially in comminuted fractures of the bones above the elbow-joint.

Only in very exceptional instances is it advisable to retain the fragments in apposition by a plate or other medium. Should such be employed the plate should be secured to the fragments some distance from the fractured end and very free drainage should be established, with a view to accomplishing the rapid sterilization of the wound. In healed cases there is always a likelihood of relighting infection. The operations needful for the restoration of a very deformed bone to its normal function are often very extensive and tedious. Radium or x-rays applied previous to operation may serve to sterilize cicatricial tissue. Vaccine treatment may also be helpful if the organisms have previously been cultivated. Vigorous massage and exercise of the damaged part will usually light up organisms if present in the scar tissues. If any infection should arise after such an operation early drainage and prompt vaccine treatment will usually save the situation. In no circumstance should the surgeon sacrifice any of the length of the bone to facilitate axial apposition of fragments. Grafts are at times useful to fill up large gaps in bone or to secure union. This is particularly so in fractures of the tibia where large areas of bone have been removed by a projectile. After affixing the fragments of the tibia securely by means of a large plate a considerable proportion of the anterior portion of the circumference of one of the fragments of the shaft can be removed with perfect accuracy by means of

a carpenter's chisel and mallet and can be filled into the vacant space and secured in position by small plates.

The conclusions that may be arrived at as to operative treatment of fractures caused by projectiles are:

That only in very exceptional circumstances is it advisable to fix fragments of broken bones together by means of plates and screws while the wound is very foul. Should the surgeon have to resort to their use he must be most careful to see that perfect drainage is established in order to avoid progressive necrosis of the fragments to which the screws are attached.

That if, for certain reasons, such a procedure is deemed necessary, screws should not be inserted near the broken extremities, but as far from the seat of fracture as possible.

That it is advisable to postpone operative interference till the wounds have healed for some considerable time, and until the tissues are, in all probability, free of organisms. Preparatory to operation every means should be taken to determine the presence or absence of organisms in the scar tissue.

That if any apparently septic focus is observed during an operation, a culture and a vaccine should be obtained from it, and employed at once should symptoms of infection of the wound develop.

That should there be any definite suspicion of the presence of latent sepsis, irrigation by Carrel's method, which is the best Lane has seen, must be adopted at once. If not the wound should be closed completely at the time of operation.

That every attempt should be made to avoid shortening of the limb, or to reduce it to a minimum. On no consideration whatever should any bone be removed. Accurate apposition can always be obtained if the surgeon knows how to bring it about. This is effected by manipulation with suitable instruments. To attempt to overcome overlapping of fragments in an old malunited fracture by traction on the limb in its length is perfectly futile.

That the apposition of the whole areas of the broken ends is not necessary, since the interval will fill up subsequently if suitable means be adopted. Fragments of bone or callus should be saved and employed to fill any interval between the pieces of the shaft.

That much heavier steel plates are required in the class of malunited fractures produced by projectiles than are usually employed in the less comminuted fractures of civil life.

It is most important that the joints which are in relation with the fractured bone shall be moved as soon as possible after the operation in order to avoid that stiffness and limitation of movement which so often complicate these fractures. This is especially the case in the joints of the knee, ankle, and foot. In order to obviate this trouble, without risking the security of the junction, the plates which are employed to retain the fragments in position must be as long and as strong as circumstances will permit. They should be secured by as many screws as possible. The plates that are often employed are quite inadequate for the purpose.

That providing no strain shall be exerted on the junction likely to develop nonunion, the sooner the patient who has been operated on for fracture of one or more long bones of the leg is got up and about, the more bone will be deposited and the more rapid will be the repair at the seat of fracture. For this purpose a good ambulatory splint is a necessity.

That should the interval between the fragments be so considerable that union is not likely to take place, even after prolonged congestion, brought about by the use of an ambulatory splint, the fragments should be secured in perfect alignment by a plate fixed vertically behind the center of the shaft. When this has been done a portion of one of the fragments, which is usually equal in bulk to a third of the total sectional area of the shaft, can be sawn and chiseled off and secured over the interval between the fragments, any piece of bone removed to accommodate the graft in the other fragment being fitted to occupy such existing interval as may be left between the bones. If

enough material cannot be obtained from the fractured bone to make a graft, it must be got from some other bone.

That most of the failures of bone grafting for extensive loss of substance are due to the surgeon depending on the unsatisfactory grip which the graft alone can be made to exert upon the fragments of the shaft. The essence of success depends on the absolute immobilization of the fragments of the shaft on one another, and of the graft upon those fragments. It is obviously ridiculous to attempt to retain the fragments of bone in a useful position by bone-grafts alone in these malunited fractures produced by projectiles, as it is in any fracture in which the material securing the fragments in position has to bear considerable strain.

That a great deal has been talked about the screws and plates acting as foreign bodies if used in simple fractures and producing a rarefying osteitis around them. Should such rarefying osteitis exist it is undeniable evidence that the technique of the operator is faulty and not the procedure. The remedy is in the hands of the surgeon, who must improve his methods. Frequent failures in unskilled hands have led many to attribute their want of success to the employment of steel plates and screws, and to attempt to avoid sepsis by using other and much less effective means.

That while the operative treatment of compound fractures produced by projectiles is the most important of all surgical procedures in warfare, it is well to remember that it demands a degree of asepsis, mechanical skill, resource, and judgment in excess of that required for other operations for war conditions.

That besides that of sepsis, usually introduced from without, though occasionally developed from a latent infection, hemorrhage is the chief risk which is associated with these operations. This can be best avoided by the use of very powerful hemostatic forceps, which are left in position in the wound for as long as possible during the course of the operation. A ligature is rarely required.

THE SURGICAL SIGNIFICANCE OF ABDOMINAL PAIN IN CHILDREN.

In a review of this subject, not without its special interest, and illustrated by clinical cases, HARTSHORN (*Medical Record*, Jan. 19, 1918) makes the pronouncement that the cause of abdominal pain in children is often very difficult to determine, and it is to be hoped that a review of its etiology will serve to emphasize anew this important fact. He regards it as a symptom which always points toward a diseased condition and one which must be carefully investigated in each case.

He places as probably the commonest causes of pain intestinal disturbances due to peritonitis, to intussusception, and to pyelitis. The attacks of abdominal pain from indiscreet dieting are the most frequently seen and most easily diagnosed, since they are almost immediately relieved by proper therapeusis.

He describes one form of pain which simulates an acute infection and is at once relieved by a high enema. This he attributes to a chronic constipation. The case with which he illustrates this type is not entirely convincing. Attention is called and very properly to a type of abdominal pain which accompanies pneumonia, which indeed sometimes precedes the convincing demonstration of this infection. Nor is the differential diagnosis in these cases always possible. It still remains true, however, that every case of acute pain with tenderness localized in the region of the appendix should be classed as appendicitis until this diagnosis is absolutely ruled out by the development of a focus elsewhere. The author believes that operative procedures in children under two years of age are not borne well. Indeed up to the age of six or seven there is a vulnerability. After this age they stand both infection and operation extremely well. It is noted that pneumococcic peritonitis is frequent, and its symptoms may be the first evidence of systemic infection; the actual inflammation of the lungs following this and developing after free catharsis has relieved the abdominal condition.

SKIN-FLAP TRANSPLANTATION AS A RADICAL MEASURE TO CURE LUNG ABSCESS AND EMPYEMA ABSCESS.

EMIL G. BECK (*Journal-Lancet*, January, 1918) notes that chest abscess which will hold a quart or two rarely obliterates spontaneously. Cases are found which for years, in spite of contracture, held as much as 1000 Cc. of fluid. The operation is usually practiced for their obliteration by the Estlander or Schede decortication of the lung, and the extrapleural resection of the ribs for the collapse of the soft parts.

In 1908 Beck described a method of obliterating empyemata and lung abscesses by means of injecting a mixture of bismuth subnitrate and vaselin, in proportion of one-third of the former to two-thirds of the latter, commonly known as bismuth paste, which has been found quite efficient in the majority of the protracted suppurating sinuses in empyemata. This treatment is applicable to cases holding not more than six ounces of fluid. Indeed, nearly every case with a small cavity can be obliterated by this treatment. In the larger cases he advises the method of closure which is based on the principle employed in closing cavities of bone lesions, such as osteomyelitis, namely, implanting skin into the depth of the cavity, in order to stop the suppuration. The interior of the cavity is transformed into a skin-covered surface. Beck thinks there is a prospect of so perfecting this procedure as to make it supplant all the extensive resections of the chest. He exhibited a little girl of nine years, who was drained at the age of five for a lung abscess, the tube passing in the axillary line in the region of the fifth rib. From this tract there was a constant discharge for fourteen years with expectoration of pus. A flap including skin, fascia, and muscle, eight inches in length, with the base toward the axilla and the apex pointing downward, was raised, and the ribs exposed. Two sections of the fourth and fifth ribs were removed. This laid open a small abscess cavity so narrow as to be considered a portion of a bronchial fistula. The walls of the abscess cavity were smooth and glistening, and in this respect different from the mucous-lined bronchial opening. On inspection the opening into a large bronchus was visible. The actual cautery was employed in this case to destroy the mucous membrane in the large bronchus, and thus insure complete obliteration of the opening.

One of Beck's cases had seven bronchial openings into the abscess cavity. In the case under discussion the apex of the skin flap was now grasped with artery forceps, and pushed directly into the cauterized bronchial opening, to plug it and to produce union of the raw surface of the skin-flap with the wound surface. This flap was held in place by tight packing with gauze. The after-treatment of the case consisted in the adhesive plaster method of epidermization of the raw surfaces and daily dressings until the entire cavity had been covered with epithelial growth.

The method has the following five objects in view:

To expose the diseased area by an adequate flap incision.

To take away every vestige of the diseased tissues under the guidance of the eye.

To close the wound in such a way as not to permit any dead space in the resected cavity, and to implant the skin-flap.

To use no suture material whatever, except ligatures for arteries, and leave the wounds widely gaping.

To reproduce epithelium of the granulating surfaces left by the flap by skin-grafts.

THE SELECTION OF DONORS BY GROUPING FOR BLOOD TRANSFUSION.

BASS (*New Orleans Medical and Surgical Journal*, January, 1918) regards it as generally recognized that isohemolysis and isoagglutination constitute a source of danger, unless a donor is selected who belongs to the same isoagglutinin group as that of the patient.

The serum of an individual may or may not contain an isohemolysin; but if an isohemolysin is present, it acts in accordance

with the laws governing the action of the isoagglutinins. The serum of Group I, which contains no isoagglutinin, never contains an isohemolysin. The serum of Group II may or may not contain an isohemolysin, but if present it acts only on the corpuscles of Groups I and III. If the serum of Group III contains an isohemolysin, it can act only on the corpuscles of Groups I and II, while isohemolysin occurring in the serum of Group IV may act on the corpuscles of Groups I, II, and III.

Consideration of this classification shows that if transfusion is performed between members of the same group, the danger of isoagglutination and isohemolysin is obviated; but if the patient and donor belong to different groups, the possibility of danger is present.

It is preferable but not always necessary in transfusion that donor and recipient belong to the same group. The essential, however, for safety is that the serum of the recipient should not agglutinate the corpuscles of the donor.

The method employed for determining the compatibility of patient and donor with reference to agglutinin and isohemolysin consists in testing serum of the patient against the corpuscles of each of the prospective donors, and the serum of each prospective donor against the corpuscles of the patient. Any person whose serum does not agglutinate the patient's corpuscles and whose corpuscles are not agglutinated by the patient's serum belongs to the same group as the patient and is a suitable donor as far as isohemolysin and isoagglutinin are concerned.

THE PREVENTION OF SECONDARY HEMORRHAGE.

LEVAL (*La Presse Médicale,* Nov. 29, 1917) classifies secondary hemorrhage as capillary that coming from vessels of small or medium size and that coming from vascular trunks. Hemorrhage from vessels of medium or large size is that which is attended by serious danger. It occurs in its secondary form from infected wounds. Secondary hemorrhage indicates inadequate disinfection of the wound and is a reproach to the surgeon who has it in charge, except in the presence of an injury to a sizable blood-vessel. He therefore strongly advises in treatment of wounds, in addition to thorough cleansing, that a systematic examination be made of any large blood-vessel or blood-vessels which may lie in the course of the vulnerating body. He quotes numbers of instances showing that severe and at times fatal hemorrhage is traceable to an unsuspected wound, which, had it been found at the time of original surgical treatment, would have called for tying of the blood-vessel. Whilst he believes that these secondary bleedings are dependent upon infection, he points out that this infection may be so slight and so well concealed that it is not suspected by the surgeon until hemorrhage occurs.

WAR WOUNDS OF THE KNEE-JOINT.

JUDD (*Surgery, Gynecology and Obstetrics,* February, 1918) in an interesting article on this subject reaches the following conclusions:

Wounds of the knee-joint in modern warfare maintain the same importance and gravity that have existed since the birth of surgery.

The resisting powers of the synovia and ankylosing tendencies vary in individuals.

In the presence of an infected projectile and infected joint fluid the synovia may still be uninfected for a certain period.

Fissures extending to the articular surface are important and are often unrecognized.

Secondary infection of the ankle-joint sometimes occurs unexpectedly and is a grave complication.

The earlier methods of non-interference, drainage tubes, and wholesale removal of bone have yielded disastrous results.

The mortality has been greatly reduced by improved methods of treatment.

Perforating wounds traversing the joint should be treated by puncture, compression, and immobilization.

For wounds with foreign bodies included, with or without bony lesions, early intervention is the secret of success.

The new era in knee-joint surgery calls for arthrotomy within forty-eight hours, removal of projectile, foreign bodies, and loose fragments, excision of path of projectile, cleansing of joint, and suture without drainage.

Extensive bony lesions demand primary resection.

It is in the decision as to what cases should properly be treated by the new era method, and what cases demand resection on account of the extent of the bony injury, that difference of opinion between individual surgeons is bound to exist.

From all points of view, vital preservation of the limb and its function, and duration of hospital stay, the results of the improved method are vastly superior.

FIFTH ANALYSIS OF CASES OF TETANUS TREATED IN HOME MILITARY HOSPITALS.

BRUCE (*Lancet*, Dec. 22, 1917) continues his most interesting clinical contributions to this subject, the previous four analyses having been published in numbers of the same journal. There were 231 cases in his first series, with a mortality of 57.7 per cent; 195 in his second series, with a mortality of 49.2 per cent; 100 in his fourth series, with a mortality of 31 per cent; and 100 in his fifth series, with a mortality of 19 per cent.

As to the cause of this reduced mortality (57.7 to 19 per cent) Bruce is in doubt. The bearing of the incubation treatment upon the mortality is illustrated afresh. The mortality of tetanus appearing within ten days of receiving a wound is 40 per cent; from 11 to 24 days, 25 per cent; from 25 to 786 days, 13.6 per cent. This long incubation can reasonably be questioned from the diagnostic standpoint, though Goadby has shown that tetanus bacilli may remain for a long time quiescent at the site of an old wound.

As the war has gone on the incubation period is lengthened. In the beginning there were 47 per cent of cases with short incubation. At the last analysis but 10 per cent of cases exhibited this phenomenon. This is regarded as a measure of the action of the prophylactic inoculations of antitoxin. During the first year of the war many of the wounded did not receive this, hence the number of acute cases with short incubation. Of the 100 cases in the last study, 81 can be regarded as general and 19 as local. Of the 81 cases of generalized tetanus the mortality was 28.3 per cent. All the cases of local tetanus recovered. There were six cases in which tetanus was reported to have followed on an operation. There was one death, a mortality of 16.6 per cent. In none of these cases was the prophylactic inoculation of antitetanic serum given before operation. The Tetanus Committee advises that when operations are performed at the site of wounds, even if they are healed, a prophylactic injection of serum should invariably be given.

Among the 100 cases 73 are noted as having received antitetanic serum in France. Twenty-one cases are reported to have received secondary prophylactic injections; 8 received three injections, 4 received four injections, and 1 received five injections.

Of these 73, 60 recovered and 13 died, giving a mortality of 17.7 per cent. Of the remaining 27 cases there is no record of prophylactic treatment in 13, although in all probability most of them received it. Of these 13 cases 11 recovered; 2 died, a mortality of 15.3 per cent. The remaining 14 cases are stated to have had no prophylactic injection of any kind. Of these, 10 recovered and 4 died, a mortality of 28.5 per cent. The Tetanus Committee of the War Office has laid down that four prophylactic injections should be given to every wounded soldier at intervals of seven days.

In the hundred cases under review the case mortality was 19 per cent. The tables do not show a diminished mortality incident to repeated injections. All of the 100 cases under review were treated with antitetanic serum. The Tetanus Committee has expressed the view that in acute general tetanus the best general treatment lies in

large doses of antitoxin by the intrathecal route. These cases do not prove this contention; indeed, the evidence seems to be to the contrary. The author states that it is evident that no case either for or against the intrathecal route can be made out from his figures, and that it would appear better to defer treatment for one or more days after the onset of the disease. This from the basis of statistics is probably due to the circumstance that the mortality is affected by the fact that the most severe cases have the promptest treatment. Nor can the tabulation respecting the effective doses be regarded as conclusive in any way concerning the value of the high dosage. Observers are in thorough accord that the lengthening of the incubation treatment is due to prophylactic injections. As regards the therapeutic effect of antitoxin serum Bruce believes the evidence still inconclusive.

In the same journal Cooper, of Bombay, analyzes 102 consecutive cases of tetanus which he himself treated. His mortality is high. In a fairly developed adult patient with severe form of tetanus Cooper gives chloral hydrate, potassium bromide, tincture of digitalis, tincture of hyoscyamus, spirits of chloroform, and chloroform water, together with chloral hydrate and chloretone and olive oil by rectal injection. About 30 to 40 Cc. of a sterile solution of chloral hydrate, 5 per cent, is injected intravenously, daily, until sound sleep is produced. Antitetanic serum, 3000 units or more, is given intravenously, daily, until the spasm has stopped.

IMMEDIATE INTERVENTION IN WOUNDS OF THE HEART.

CONSTANTINE and VIGOT (*La Presse Médicale,* Nov. 29, 1917) report two cases of wounded heart recovering after prompt intervention. The first case was one of a deep, non-penetrating wound of the left ventricle. The projectile was found lying loose in the pericardium. The foreign body was removed and the wound of the heart sutured. Convalescence required but fifteen days. The second case was one of wound of the left auricle, which was sutured. Subsequently it was complicated by hemothorax, which became infected. The cavity was sterilized by the Dakin solution. The patient was discharged cured in seven weeks. The missile was located by an *x*-ray in the left lung.

The reports regarding symptomatology support the statement that the diagnosis can be established in wound of the heart by the absolute immobility of the cardio-pericardial shadow as seen by the radioscope. This immobile shadow indicates a hemopericardium. Thorough exposure of the heart was accomplished by section of the sternum. The flap may be made by transverse section of the sternum with partial resection of its left border, including the cartilage of the third, fourth, and fifth ribs, or the pedicle may be made to the left, including the third, fourth, and fifth cartilages, and the entire sternal segment corresponding to these cartilages. It gives a splendid exposure.

ETHER THERAPY IN SURGICAL INFECTIONS AND ITS EFFECT ON IMMUNITY.

SALIBA (*New York Medical Journal,* Jan. 26, 1918) states that experimentally and clinically, ether, whether in its vaporous or liquid state, has been proved to have a bactericidal action. It is a lymphagogue, a cell proliferant, has a stimulating influence on the hematopoietic organs, either kills or renders vulnerable bacteria, and is a valuable therapeutic agent in septic wounds, abscesses and sinuses, peritoneal infections, pleuritic infections, joint cavity infections. Therefore it is a useful irrigant. As for abscesses, the author evacuates them of their pus by incision or aspiration and flushes with normal salt solution; or if the pus be thick, he introduces ether into the cavity and sews up the incision, generally without drainage. He does not mention the results following this treatment. After opening the belly for ruptured duodenal ulcer, for instance, he finds the use of ether by lavage or instillation beneficial. In pleuritic infections he lauds highly irriga-

tions of the pus cavity with ether. In joint cavity infections aspiration is followed by ether injection supplemented by extension by weights to overcome muscular contraction. If the joint refills it is reaspirated and reinjected.

TONSILS A CAUSE OF AND TONSILLECTOMY A CURE FOR "RHEUMATISM."

JAMES (*Minnesota Medicine,* January, 1918) expresses his sincere belief to the effect that the profession has gone "plumb locoed" on the tonsil question; that one of its latest fantasies in the treatment of rheumatism seems to be "tonsillectomy," which has followed the fast and rapidly disappearing vaccine fad. He quotes certain recent reports from the Johns Hopkins Hospital to the effect that in 1000 tonsillectomies analyzed there were nine that had rheumatic arthritis, and only two were improved, two unimproved, and five were made worse.

There were twenty-five who suffered from rheumatic fever, and four of these had recurrence before leaving the hospital.

The results of tonsillectomy in cases of chorea were far from pleasing. The author holds that joint lesions, appendicitis, inflammation of the gall-bladder, tuberculosis, poliomyelitis, and many other diseases may have their source in bacterial infection, but as a cause of rheumatism they have not a single pedestal to stand on for support.

Diseased tonsils that cannot be cured should be removed. Tonsillectomy for prevention or as a cure for rheumatism is a delusion and a snare.

TREATMENT OF GONOCOCCAL ARTHRITIS BY SENSITIZED VACCINES.

HAWORTH (*British Medical Journal,* Jan. 5, 1918) thus prepared the sensitized gonococcal vaccine. A pure growth was obtained from the swollen knee-joint, the contents of which were markedly purulent. This was cultivated in blood agar at intervals of two days until good growths resulted. A series of blood-agar slopes were incubated for twenty-four hours. These slopes were emulsified in normal salt solution, counted, mixed with antigonococcus serum, and incubated after twenty-four hours; thereafter placed in a refrigerator for another twenty-four hours. Decanted, diluted with fresh normal saline; again refrigerated. This process being repeated still again, twice more, after which a solution of carbolic acid was added and there was further refrigeration for four days. The bacterial emulsion was tested for sterility, and if found sterile was ready for use.

The first dose was 25,000,000, the thirtieth day 550,000,000; thereafter an increment of 50 million every five days. Some seventeen cases were reported, all with excellent results. The last eleven were given about twice the dose already mentioned. Only a few cases showed any reaction after administration.

AN ADDRESS ON THE ORTHOPEDIC OUTLOOK IN MILITARY SURGERY.

JONES (*British Medical Journal,* Jan. 12, 1918) divides the problem into two parts—preventive and corrective. The latter is more especially the department of the trained orthopedic surgeon. The preventive requires the help of every surgeon who has to treat wounded men at any stage. Gunshot injuries of the femur constitute the tragedy of war. He suggests that these injuries should be put in the hands of specially trained men who should be retained for this work only and should proceed in association on a common plan. As to the plan, this consists, first and foremost, in the concentration of all fractured femurs in special fracture hospitals at the base. These fracture hospitals should be visited by an inspector of fractures acting in conjunction with the consulting surgeons of the various districts.

One of these hospitals should be chosen as an educational center, and all young surgeons who can be spared from time to

time should undergo training there. Certain nurses and orderlies should also be trained, and in this way teams prepared to do rapid and efficient work at the casualty clearing stations.

A trained surgeon, an orderly, and a sister would do more rapid and efficient work as a team than half a dozen most excellent surgeons who do not possess this special experience. The training school in an incredibly short time could supply regimental aid posts and casualty clearing stations with teams of surgeons and orderlies taught to fix these fractures efficiently and with astonishing rapidity.

Two fundamental principles must be sacredly adhered to:

1. Efficient fixation in correct alignment at the earliest possible moment.

2. Continuity of treatment.

Death, when it occurs early, is usually due to shock, the result of direct injury, the shock being often increased by exposure and the movement of injured tissues during transport. Fixation, therefore, should not be delayed a moment. For the purpose of rapid, simple, and efficient fixation there is no splint to compare with a Thomas.

These splints can be rapidly applied over the trousers and extension made by a pull on the boot. Twenty or thirty cases can be dealt with in an hour by a trained team of orderlies.

The wound is next thoroughly overhauled in the casualty clearing station. When this can be done with the limb well extended in the splint it is an advantage. This extension of the limb undoes all kinks and folds wherein discharges may collect. When the wound is thoroughly dealt with, and the limb fixed for permanent treatment, the case is sent down the line whenever it is safe. Experience has proved that, since such cases cannot be kept indefinitely at the casualty clearing stations, they should be sent down at the earliest possible moment after the recovery from shock, before sepsis has had time to spread and before the danger of secondary hemorrhage has set in. Cases do best at the base hospitals when they are received there during the first three days.

This secures for us the second principle —continuity of treatment. The teams at the regimental aid posts, the casualty clearing stations and the base hospitals will have a common understanding, and no unnecessary change of methods is likely to occur.

Both at home and abroad the defects of treatment run on similar lines, namely, inefficient reduction, fixation, and extension. These defects will be mostly overcome by segregation and a carefully selected personnel.

In the lower limb, fractures of the bones of the leg are too often associated with a backward sagging at the site of fracture, due to inefficient support; or they present a valgus deformity at the seat of fracture, which is a very serious fault, for the body weight is deflected on to the inner side of the foot, thus producing the more serious disabilities associated with aggravated flat-foot. A bow-leg is a strong leg even if it is ugly, while a valgus leg is both weak and ugly.

Non-union, or delayed union, is far too commonly met with in fracture of the humerus. This is most frequent when the fracture is through the middle third. Two factors are mainly responsible for this over-extension and inefficient fixation. If, for purposes of drainage and fixation, extension is used, it should never be excessive or prolonged; it is an easy matter to separate the fractured ends of the humerus by an inch or more if traction is severe. The other factor is inefficient fixation. Whatever splint is used, it should enable the dressing to be applied without disturbance of the fragments, and it should permit flexion of the elbow to considerably above the right angle. The prevailing deformity in fractures of the lower end of the humerus is a backward thrust of the elbow. This is best governed by flexing the elbow sufficiently. Fractures through the elbow-joint, in view of ankylosis, should be treated at right angles. It is in this fracture specially that care should be taken

to keep the forearm about three-fourths supinated, for a pronated hand with ankylosed elbow is tragic.

Two serious dangers in compound fractures of the forearm exist. One is vicious union between the two bones, and the other is sagging or convexity to the ulnar side. Both lead to impairment of pronation and supination. To prevent these deformities we should first make sure that the ulna is in line, and then secure supination. Any theories we may hold in regard to the action of the pronator radii teres may be discarded, for pronation of the forearm is a direct invitation to cross union. It is a sound rule in all fractures of the upper limb to see that the palm is toward the face when the elbow is flexed.

The results of primary excision of joints are filtering into the orthopedic centers. Surgeons abroad should know that the functional results are very bad. Flail knees, flail elbows, flail shoulders—many of them suppurating—are constantly in evidence. They present a serious problem to the surgeon. We have been able to ankylose many of the elbows with good functional result. This is true to a less extent in the case of knees and shoulders. Some of the excisions of the knees well above the condyles and below the tuberosities leave very little in the way of bearing surface to work upon. Indeed, in those cases amputation is often justified. We must at once admit that any surgical procedure is welcomed which will save an amputation, and this is especially true of the arm. The artificial arm is a miserable substitute for a living one, however maimed, and to amputate an arm should be almost the heaviest responsibility a surgeon can assume. Primary exsections of joints or muscles are infinitely to be preferred to a loss of limb, but is amputation always, or often, the alternative?

We constantly receive from certain sectors gunshot injuries to joints—especially knees and shoulders—where immediate excision of the wound (not the joint) has been practiced. The results are often surprisingly good. At one hospital we had at one time five such cases of gunshot injuries through the knee, and in three of them a perfectly functioning joint resulted, while in both the others the wounds had healed without incident. If such joints had been subjected to primary excision, what a tragedy it would have been! Should these excisions be called for, an authoritative ruling on the matter is needed, clearly specifying the types that can be spared and those that must be sacrificed.

If the shoulder is excised, the arm should be placed in an abducted position at an angle of about 50 degrees. The elbow should be slightly in front of the coronal plane of the body, so that when it is at right angles and the forearm supinated, the palm of the hand is toward the face. The bones should be approximated by posture at an early date. If ankylosis occurs in this position, the arm can be lifted to a considerable height by scapular action. The arm should not be left hanging, as there is on the one side a danger of a useless flail shoulder, while on the other, should it become ankylosed, the movement will be very limited. If the excision should result in a flail shoulder, it should be ankylosed in the position described.

Excision of the elbow-joint with complete removal of the condyles and of the olecranon generally leads to flail elbow—a most useless elbow to a working man. On the other hand, an elbow ankylosed firmly at nearly a right angle is very serviceable.

Such excisions of the elbow Jones advises should be kept extended and supinated during the early stages of drainage, then gradually flexed to a right angle, even if sinuses discharge. If the elbow is kept straight while a suppurating wound heals, there is a danger of ankylosis in extension. If there be no suppuration the elbow can be flexed from the first. The worst cases, for reasons which are obvious should ankylosis result, are those which have been kept straight with the forearm pronated.

In all gunshot injuries about joints, where ankylosis is feared, the arm should

be placed in a position most useful for the patient in after-life: the shoulder abducted, as already described; the elbow at an angle of about 70 degrees flexion from full extension; the forearm nearly two-thirds supinated; the wrist in dorsiflexion, and the hip in slight abduction and external rotation with full extension; the knee in full extension; the ankle at right angles, and very slightly varoid.

In recovering nerve injuries, whether after bruising of the nerve followed by spontaneous recovery, or after suture for a divided nerve, the muscles supplied by the nerve must be kept continuously relaxed by splinting the limb: first, because paralyzed muscles are easily overstretched, and overstretched muscles cannot contract; secondly, because relaxed muscles are more susceptible to returning trophic influences and are in a state to respond to the first feeble motor impulses that come to them through the recovering nerve. It is then that voluntary reëducation can be begun. For the same reason all deformities which would impede the action of the muscle should be corrected as a preliminary to nerve suture unless this subsequent correction can be easily secured without straining the fresh union in the nerve.

VAGINAL DISCHARGE IN CHILDREN.

RUBIN (*Boston Medical and Surgical Journal,* Jan. 31, 1918) on the basis of 255 selected cases observed in the course of four years and referred to the vaginitis class by the chiefs of the children's clinics in the dispensary, states that of all the cases from the clinical side the very smallest number were gonorrheal—that is, resembling the disease in the adult. A definite history of contact infection was obtained in only one case. In two others there was definitely the evidence of a ruptured hymen without the history of such an assault. Nearly always the complications and sequelæ of gonorrhea were lacking. Attention was called to Louise Pearce's work on the comparison of adult and infant types of gonococci, who found that strains of gonococci from adults and the strains from children differ so uniformly in both agglutination and complement fixation that they could be distinguished as two distinct types corresponding to the clinical source of the strains.

It is worthy of note that three of the strains of gonococci isolated from the three cases of ophthalmia are classed with the adult type. That a true gonorrheal infection does occur in children cannot be denied. If the majority of children having a vaginal discharge are infected with gonococcus it must in all probability be a different organism from that described by Neisser as occurring in the adult. It may well be that the infectious vaginal catarrh which spreads through hospital wards may have some of the bacterial etiology of the gonococcus. Moreover some other method of diagnostic control other than smear examination must be available if we are to treat it intelligently and scientifically. Not only is there the greatest discrepancy between the clinical picture and the smear report, but in a series where two different bacteriologists made the examination there was the greatest contradiction in their reports on the same material examined. Both were men of the highest type.

The author holds that to establish the diagnosis of gonorrheal vaginitis in children and infants, it is necessary to have: (1) A purulent discharge from the vagina. (2) The intracellular Gram-negative diplococcus of Neisser must be discovered in the pus cells (smears and cultures are facilitated by the endoscope). (3) This organism must further be identified as the gonococcus. (4) In case of doubt, complement-fixation tests and agglutination tests should also be resorted to. In the absence of these tests we are not justified in considering any vaginal discharge in children as gonorrheal, nor are we justified in treating as such. The smear examination, even by the Gram stain of secretion or discharge from the vagina, is unreliable and misleading, and hence valueless as a method of diagnosis. The desideratum in the prob-

lem of vaginitis among children, therefore, is more complete and scientific bacteriological study, including animal inoculation.

MALIGNANT TUMORS OF THE TESTICLE.

LEVIN (*Urologic and Cutaneous Review*, January, 1918) states that these tumors are usually of mixed teratoid character. They are the most radiosensitive of all malignant tumors with the exception possibly of lymphosarcomata. Nevertheless they disseminate so rapidly and extensively that whenever possible the main tumor mass and inguinal glands should be removed by the more rapid surgical method and the remaining tissue then be treated by radium.

FACTS AND FANCIES IN DISINFECTION.

In a brochure on this subject (*Studies from the Research Laboratory of Parke, Davis & Company*, Reprint No. 121, 1917) attention is called by HAMILTON to the well-known but forgotten circumstance that disinfection is generally overrated because in the hands of a careful user exceptionally good results were obtained; whilst, on the contrary, some are discredited because of being used under improper or inappropriate conditions. In regard to the use of formaldehyde gas as a disinfectant he observes that there are three highly essential factors in a successful fumigation, namely, a very rapid evolution of gas, a percentage of moisture in the air approaching saturation, and absence of air currents. It follows that for fumigation this must not be attempted on a windy day, that the air must be rendered moist by sprinkling with water about fifteen minutes before, and if possible that a permanganate or chromate salt be used to develop the requisite heat.

Calcium hypochlorite or bleaching powder is one of the very few substances which spontaneously evolves an efficient disinfecting vapor.

As to hydrogen peroxide with a phenol coefficient at 0.03 it is as strong as a 3-per-cent solution of phenol, and therefore theoretically capable of destroying almost all infectious organisms. Practically, however, it is so rapidly destroyed in contact with organic matter that no great dependence can be placed on it as a disinfectant unless used repeatedly in considerable quantities. It has a value, however, all out of proportion to its germicidal action, in that as an active oxidizing reagent the evolved gas acts as a cleansing agent, the foreign matter in wounds being extruded in a very efficient manner. It is therefore active in proportion to its hydrogen dioxide content, but not primarily as to its phenol coefficient.

As to soap, a pure, neutral soap has little germicidal action in any practicable strength of solution. A 5-per-cent solution of most soaps is efficient in killing all non-spore-bearing bacteria in a few minutes, but this is not a practicable solution to obtain except with soft soap. The alkaline soaps may, however, have relatively high values. The neutral soaps are indirectly valuable because of their cleansing properties, particularly in the removal of a protecting fatty film on the skin, thus allowing penetration of an active agent. Theoretically a true disinfectant associated with soap is an ideal combination for cleansing and disinfecting the hands and the site of an operation. Symes has found that a one-per-cent solution of soap—as strong as an average solution can be made—kills some bacteria in ten minutes, but most are not killed after hours of exposure, which is also true even of a 5-per-cent solution. By the addition of biniodide of mercury to the soap a solution is made which is very effective for disinfecting instruments and the field of an operation.

Ethyl alcohol is largely used as a disinfectant at the site of an operation or injection, but by many it is regarded as of little value. It is generally considered that only the medium strengths of alcohol are active. Recent experiments have seemed to show that unless the bacterial envelope contains a certain amount of moisture it is impervious to strong alcohol, but dried

bacteria in contact with dilute alcohol containing from 30 to 60 per cent of water will absorb the necessary amount of water therefrom very quickly, thus enabling the alcohol itself to reach the cell protoplasm and destroy it. Hence sponging the site of an operation with alcohol after scrubbing with soap is a safe procedure; adding acetone to the alcohol is logical as a fat solvent and is quite commonly practiced. He further aids disinfection by the addition of 1 to 2 per cent of a high coefficient coal-tar disinfectant to the acetone-alcohol mixture by which one can obtain a sterilizing solution equivalent to 40-per-cent phenol. Such a solution is neither poisonous nor irritating except when the hands are encased in rubber gloves after being treated with the mixture.

It has been observed that Dakin has brought into use a valuable form of hypochlorite. While the solution eusol and the powder eupad suggested by him have no extraordinary values, the toluene derivative, chloramine-T, has properties which would commend it to attention. Germicidal assays by the accepted methods show its value to be 50. The presence of organic matter materially lowers its value.

PYROGENIC THERAPY.

Under this title AULD (*British Medical Journal,* Feb. 16, 1918) extols the therapeutic value in cases, for instance, of chronic infection such as are clinically manifest in the form of the various arthritides of supposedly toxic origin, of the tissue changes which are either caused by a high temperature or are incidental to it. He has experimented with metal colloids, particularly platinum, as a means of producing this temperature, but regards typhoid vaccine as probably the best and most efficient pyrogenic which can be used. Nucleic acid 2 per cent and albumose produce similar effects. From 50 to 250 million of killed typhoid bacilli are injected intravenously according to the strength of the patient and temperature. In apyrexial cases doses should be greater than in cases of pyrexia. The treatment is especially adapted to sluggish cases of localized infective diseases, with low or moderate pyrexia. Little benefit results unless the full reaction is induced, and rarely more than one injection is necessary. An overdose is indicated by dyspnea, cyanosis, and diarrhea. Nor should the injection be given while the temperature is high. Heart disease, high blood-pressure, and rigid arteries are contraindications. It is not necessary to produce shock.

BACK TROUBLES.

Under this title, with some additions to it, MARSHALL (*Boston Medical and Surgical Journal,* Feb. 28, 1918) contributes a useful article of a practical nature, based on extensive clinical experience.

He presents an analysis of a hundred back cases. Twenty-nine of these cases came either once or twice, mainly for diagnoses or *x*-rays.

Sixty-four of the hundred cases completed their treatments and disappeared in a year or less, coming to the hospital from two to twenty-four times, averaging six or seven visits before they were lost to observation.

Seven of the hundred cases required one year or more of treatment owing to recurrences of back symptoms. The longest time was two years and two months, and even then relief was not obtained.

Average durations of treatments among the majority of cases of back strains and infectious arthritis were six or seven weeks. In the hypertrophic group of older patients, ten to eleven weeks of treatment were required, on the average, by most of them.

Among these hundred patients twenty plaster jackets were put on; twenty-four webbing belts fitted; adhesive strappings were applied to forty-four patients; leather jackets or steel braces given to seven persons; medico-mechanical exercises prescribed in ten instances; hydrotherapeutic treatments taken by eighteen patients; and twenty-nine patients received drugs of

various kinds. Seventy-two of the hundred were examined in more than one department of the hospital. Ten had their teeth examined by *x*-rays for infectious foci, and seven of the ten showed negative results.

Plaster jackets were put on within a few days after patients first made their appearance, in fifteen of twenty cases. The remaining five were deferred until moderately severe symptoms failed to respond to adhesive strappings.

The usual indications for plaster casts were *x*-ray appearances that looked suspiciously like early tubercular spinal lesions; or very acute pains with marked muscular rigidity.

Duration of wearing jackets varied from nine days to ten months, depending upon different circumstances.

Splitting of jackets often occurred after two or three weeks' wear; then patients continued to wear them split for variable lengths of time, according to individual requirements, while belts were being made.

Two patients experienced extreme relief immediately. The majority of patients were relieved more slowly. One patient claimed that no relief was obtained, one said the jacket made his pains worse, and one never returned after the first visit at which the jacket was immediately put on. One, which subsequently proved to be malignant disease of the sacrum, was relieved greatly for nine weeks previous to his disappearance from hospital observation.

The strappings caused great relief promptly in one to seven days among six patients of the forty-four which were strapped. The majority were improved more slowly. No relief was obtained in eight cases, and one patient stated that strappings increased back pains. The most satisfactory result occurred with complete relief in twelve days from two strappings in an acute, moderately severe type of back strain. Webbing belts very commonly were substituted for strappings, if the latter failed to relieve pains completely after a few weeks.

The webbing belts were ordered after adhesive straps, or for patients whose severer symptoms had been partly relieved by plaster jackets. They were worn very variable lengths of time, patients commonly ceasing to return to the hospital as soon as they received their belts, while symptoms were subsiding.

Leather jackets and steel braces were prescribed seven times for chronic troubles and faulty postures. They duplicated in convenient forms many of the effective features of plaster casts. They usually are worn for considerable periods.

Hydrotherapeutic baths, given to eighteen patients, were prescribed immediately in seven instances, one to nine baths in twenty-five days or less. Usually when they were combined with tonic-eliminative drugs in early cases there followed prompt relief of backaches except in one case of associated kidney stone. Ten of eighteen cases were prescribed after plaster casts had partially relieved the pains, or after Zander exercises had been tried, or webbing belts were producing only fair progress. Four or five bath treatments generally were taken on an average; but one patient received thirty-eight in one year and five months.

As the result of hydrotherapeutic baths prompt relief followed in several cases, and all patients were more or less improved for a while, at least; also no unpleasant effects were observed.

Medico-mechanical exercises were given almost always late in courses of treatments, after belts and jackets had partly relieved pains at the expense of increasing stiffness. From one to twenty-seven treatments were received in times ranging down from three months as the maximum. The majority of the ten patients took only three or four on the average. No bad results were reported and usually patients were partially limbered up again.

Medicines were given in medical departments of the hospital to eight patients for special complaints. Aspirin or sodium salicylate was prescribed for eight other patients. Mild tonic-eliminative drug combinations were given in the orthopedic department to twenty-one patients in order to

rectify obscure vascular conditions, and thus accelerate restoration of musculoligamentous strengths.

Statistics presented by these hundred cases indicate that enough was done for them, and that a sufficiently varied set of therapeutic measures was employed. Fair degrees of skill, at least, are shown by absence of poor results in most cases; and exact degrees of skill never can be estimated closely from statistical data.

TREATMENT OF FRACTURE OF THE EXTREMITIES BY MEANS OF SUSPENSION AND TRACTION.

LAKE and BULKLEY (*Surgery, Gynecology, and Obstetrics,* March, 1918) favor this method of treatment because of the improvement of circulation of the limb, greater ease of dressing, the facility with which the fracture can be controlled, and the greater comfort to the patient. They believe that union takes place more rapidly, that spreading infection necessitating amputation is less frequent, and that the motion of contiguous joints is more free, than by the use of any method of treatment involving absolute fixation.

Military fractures differ from those in civil life as they are mostly inflicted by shell, associated with more or less extensive loss of muscle tissue or attachment, or with nerve injury resulting in paralytic muscle. It is invariably necessary to place the limb in such a position and maintain it there so that the lower fragment is brought into correct alignment with the upper. This can best be accomplished and the concurrent wound at the same time be best treated by combined suspension and traction. Proper alignment can be obtained by carefully controlled bedside roentgenography.

The apparatus for suspension consists of two frames, each fitted to the end of the bed. Each frame consists of two parallel bars, the lower placed at the upper level of the mattress and the upper just low enough so that the uprights are not split by holding the screws. The upper transverse bar is notched to hold the longitudinal bar, each upper transverse bar having nine such notches. Each longitudinal bar has two notches at a distance from each other corresponding to the distance between the two end frames.

The end frames have the form of a truncated cone, base downward, the distance between the feet being a little more and the distance between the upper ends being a little less than the width of the bed. The width, therefore, is an inconstant factor depending on the bed used. The height is generally two meters. In order to allow the patient to change position suspension must be movable after fracture of the lower extremity. This is accomplished by the use of a trolley. The limb is suspended by cloth bands, or metal splints, to which cloths are attached, or adhesive material. Sinclair-Smith glue is employed, made up of common glue 50, water 50, glycerin 2, thymol 1, calcium chloride 1. The chief advantage is that the part does not require shaving before application, and it can be removed by the application of hot moist towels. It should be painted on the skin hot, in a direction opposite to that in which traction is to be made. This avoids the discomfort of pulling hairs. After the glue is applied to the skin special extension bands of canton flannel are wrapped on the extremity and laid in place. These bands are made in two sizes. Traction can usually be applied about twenty minutes after the bands have been glued in place. The constant supervision and revision of position and weights is necessary to obtain the best results. Each day the apparatus must be examined and the alignment of fragments clinically noted. If the slightest doubt as to position occurs, a bedside fluoroscopic examination or roentgenograph should be made.

As to the humerus, this is directly suspended and the forearm is also suspended. The humerus is suspended by a single band of double-faced rubberized linen 20 centimeters wide and 70 centimeters long. This single band passes under the arm, one end of it being attached by thumb tacks to a block of wood. The other end is pierced

by eyelets which accurately fit small nails on the opposite side of the same block. Thus the band is not only prevented from becoming wrinkled, but it can be readily removed for dressings. To each end of this block of wood is attached the extremity of a cord about 50 centimeters long. The relative amount of suspension obtained at the proximal and distal ends of the band can be controlled by shifting the point of attachment of the vertical cord to the cord attached to the block and anchoring this point of attachment with adhesive. In general, a kilo and a half suffices for the direct suspension of the humerus.

The forearm is suspended by two bands glued on the flexor and extensor surfaces. They should not meet on the lateral aspect of the arm. The tapes fastened to the ends of these bands are attached by buckles to a wooden spreader, at the center of which is a hole for a knotted cord for suspension. The spreader for the hand should be a little longer than the width of the fist and three-quarters as wide as its length. The straps of the suspension band pass over the side of the spreader, while to the ends of the spreader are fixed two elastic tapes attached to a round handle which can be adjusted so that the fingers can readily grasp it for exercise. This arrangement is of importance, especially in lesions of the musculospiral nerve. The suspension cord passes to a pulley on a longitudinal bar above the bed, this bar being placed 20 or more centimeters to the outer side of the bar by which the humerus is suspended. Thus the external rotation of the lower fragment is obtained, a result difficult to get if both humerus and forearm are suspended in the same longitudinal axis. The pulley suspending the forearm is usually placed sufficiently toward the foot of the bed to keep the elbow at an angle of about 135 degrees. Later the angle may be decreased to 90 degrees, but the larger angle, if used early, assists in traction.

If traction be needful it can be obtained in two ways. Traction on the lower fragment by means of glued bands on each lateral aspect is very efficient. The spreader for traction of the arm should exceed the width of the elbow by 2 centimeters to avoid pressure on the humeral epicondyles. Traction is made from the spreader by means of a cord which passes over a pulley in a transverse bar attached at a suitable height to the frame at the foot of the bed. If the wound in the arm is in such a position that glued bands cannot be applied, traction can be obtained by means of a band passed about the lower humerus in much the same way as in the method of Hennequin in fractures of the femur. This band is made of heavy muslin, about 6 centimeters in width and 1 meter in length. Its center is placed on the posterior surface of the lower arm, each end being brought forward and crossing to the opposite side, where it is pinned in such a way that the traction, when applied, will be in the same axis as that of the humeral shaft. In low wounds of the arm a thick layer of cotton should be placed between the dressing and the band. Counter-traction by the weight of the body is sufficient for fractures of the humerus.

In all fractures of the humerus treated by this method the patient should be encouraged to move the shoulder, elbow, wrist, and fingers, and the hand and fingers should receive daily massage.

In the humerus, upper third, including resections of the humeral head, cases falling in this group should all be suspended as above outlined. Following humeral head resections, traction should not be used. The deltoid should not be stretched but rather allowed to crowd the divided shaft as closely as possible into the glenoid. Loss of function of the circumflex nerve or extensive loss of substance of the deltoid means a poor end-result following resection. The arm should be abducted nearly to a right angle in order that this position after healing can be assumed by the patient. Adduction can always be obtained by rotation of the scapula.

In high fractures of the surgical neck, the upper fragment is usually abducted and strongly rotated outward. The lower fragment must, therefore, be brought into this

position. The amount of traction in such a case must depend on the bedside roentgenographic findings.

In the fractures of the upper third of the shaft below the surgical neck, traction is usually necessary but need seldom amount to more than 2 kilos. It can usually be applied by means of glued bands. Suspension is carried out in the usual manner. The amount of abduction necessary will depend entirely on the amount of muscle injury. If the pectoral and latissimus attachments are lost the abduction requirement will be greater than if these muscles are intact. Generally speaking, these fractures require about 60 degrees abduction. A very simple method of obtaining this consists in a rough unplaned board about 50 centimeters longer than the width of the bed and about 25 centimeters in width. This is passed between the mattress and bedspring, and is held in whatever position desired by friction and the weight of the patient. To its free end is attached an upright carrying a pulley. It can be placed in any position desired. It is essential that this board be rough and unpainted.

Fractures of the middle third are suspended in the usual fashion, but require careful attention to prevent anteroposterior bowing. Traction is usually made at an angle of abduction of about 45 degrees and with a weight of about one and a half kilos. The concurrent wound is usually such that a Hennequin band must be used, and it is in this group of fractures more than any other that the band must be pinned so as to pull exactly in the axis of the humeral shaft. If the band is not pinned sufficiently low, anterior angulation will occur, and if pinned too far posteriorly, backward angulation takes place. The angulation is also controlled by the relative amount of weight used to support the forearm and the arm. Too much weight attached to the forearm results in posterior angulation, while too little allows a sagging of the elbow with resulting anterior angulation.

The higher fractures of the lower third are treated exactly as are those of the middle third. Care must be taken that the band supporting the humerus extends well below the site of fracture, as otherwise the elbow will sag and anterior angulation occur. Abduction need rarely exceed 25 degrees. Traction of one kilo is usually sufficient.

After resection of the elbow, traction should never be used. The functional result obtained will depend largely on the operative procedure. If a careful subperiosteal resection, practiced by the Lyon school, is done, early motion of the elbow should be encouraged with the view to reformation of the joint. If the periosteum has not been preserved, the best that can be looked for is ankylosis, but a flail joint will more often be the result. Suspension for this second type of case is useful only until the subsidence of the infection in the wound, and should be replaced by absolute immobilization of the elbow in plaster as soon as possible. If ankylosis can be obtained, the angle of choice depends on the occupation of the patient. In a laboring man or farmer, about 135 degrees gives the most useful arm.

In compound fractures of the elbow-joint without resection and in suppurative arthritis of the elbow-joint, suspension is most valuable but should be made only by the forearm. The weight of the upper arm then tends to keep the ends of the bones separated and thus facilitate drainage.

The forearm is suspended in a cradle, traction being applied by means of glued strips. When wet dressings or continuous irrigations are used, bands of double-faced rubberized linen can be employed. If the wounds permit, extension can be made by bands glued to the lower forearm. In lower wounds very satisfactory traction can be obtained by means of a glove. The hand is first thoroughly covered with glue, and then a white cotton glove, to the end of each finger of which has been attached a small metal ring, is drawn on. Traction is then made through the fingers, as much as a kilo and a half of weight being used. Great care must be taken that at least twice each day the traction is removed and both active and passive motion of all the small

joints of the fingers practiced. Full supination is seldom necessary, a point a little short of this usually sufficing to prevent cross-union.

In cases with considerable edema, it is occasionally useful to suspend the forearm, either with band or a glove, in the vertical position. As soon as the condition of the wounds permits, the majority of fractures of the forearm, especially if one bone alone is involved, can be treated in molded plaster, as suspension offers no particular advantage.

All fractures of the femur, whatever the level, are suspended. A modified Thomas or Hodgen splint is recommended. Traction is provided for in one of three ways: (1) by glued bands; (2) by direct bony skeletal traction, as by a Steinman pin or a Finochetto band; or (3) by pressure on the calf with a flexed Hodgen splint.

Glued bands for fracture of the femur are usually unsatisfactory but must be occasionally used, especially with a straight splint. Much of the traction is lost, being transmitted to the pelvis by the skin and deep fascia. Consequently 10 to 15 kilos of weight are needed.

With skeletal traction, especially with a Steinman pin through the femur, about one-third of this weight is necessary. It is the ideal form of traction provided the question of infection can be eliminated. It is especially applicable in fractures of the upper half of the femur in connection with a well-bent Hodgen splint.

In the third method of applying traction, the knee is flexed and the tractive force is applied against the back of the calf. This is ordinarily accomplished in one of two ways. In Hennequin's method the limb, as high as the mid-thigh, is surrounded by a very thick dressing of non-absorbent cotton snugly bandaged in place. The knee must be kept in flexion while the dressing is applied, and it is well to put a wet crinolin or very thin plaster-of-Paris bandage over all to keep the dressing in place. A figure-of-eight hitch is then made about the thigh and knee by means of a sheet folded several times so as to make a band a meter and a half long and 15 centimeters wide. This is probably the best method when the Steinman pin cannot be used for high fractures of the femur. It obviously cannot be used in cases with low wounds of the thigh. The other method of calf traction is to bandage the leg to a well-bent Hodgen splint and make the traction on the latter. This method affords access for dressing to wounds in the lower part of the thigh, but is scarcely applicable for initial traction because the pain and pressure on the calf are too great. Later when less traction is needed it becomes a very serviceable method.

For fractures of the upper portion of the femur Hodgen's splint is shown in abduction and considerable elevation and external rotation. Traction is made strong during the first week and is generally 10 kilos. In wounds of the middle third the position assumed by the upper fragment is in abduction if the fracture is above the adductor longus insertion; otherwise it is nearly straight. It is moderately flexed and rotated out.

The method of treatment depends on whether a Steinman pin can be used or not. If it can be used, the limb is put in a well-flexed Hodgen splint with the knee and hip flexed, and is suspended in a position of moderate abducton and rotation outward. A traction weight of 4 to 5 kilos is to be used at the outset.

If the Steinman pin cannot be used on account of infection, extension straps or the stirrup are used with a straight Hodgen or modified Thomas splint (the latter gives better lateral control of the fragments), and the limb suspended in a position of slight abduction and flexion at the hip with rotation outward. A traction weight of 10 to 12 kilos is used at the outset.

Fractures of the lower third of the femur are very difficult to treat on account of the position of the wound, which often prevents the application of the proper method.

The position assumed by the upper fragment is practically in line with the body, the tendency to flexion being overcome by the sheath of the surrounding muscles. It

rotates outward about 30 degrees. The lower fragment, however, flexes at the knee, and in order to get it in line with the upper fragment the knee must be flexed. The only efficient way in which to apply traction with this position of the knee is by means of the Steinman pin, and this should be used in all clean cases. Treatment then is simple, and the leg is put up as described for fractures of the middle of the shaft, with a weight of 3 to 4 kilos.

But in the majority of cases the Steinman pin cannot be used on account of infection, and then one is forced to use treatment bad in principle, namely, to put the limb up in a straight splint with extension straps or the stirrup for traction, and wait until union is just beginning but the fracture line is still soft and pliable. The straight splint is then removed and a Hodgen splint, angulated to about 110 degrees, put on. When the limb is bent on this splint, flexion will not take place at the knee, which will have become stiffened, but at the fracture, and the fragments will be brought into line. To be successful, strong traction must be made up to the time of changing the splints, so that the muscles are actually overstretched and all overlapping overcome.

All wounds and fractures of the tibia and fibula repair far more quickly if the limb is suspended, and this should always be done. The Hodgen splint bent to an angle of 135 degrees is employed. The leg is suspended in the splint by the usual bands and the splint suspended above the bed by the trolley previously described. Counter-traction is obtained by the portion of the splint supporting the thigh, care being taken that the upper suspension cord passes to the longitudinal bar on the opposite side of the bed.

Fractures of the fibula alone are of little consequence, being well supported by the tibia. They are suspended because of the improvement in circulation and for the dressing of wounds, but no traction is necessary.

Fractures of the tibia alone are splinted by the fibula and are prevented from overriding to any great extent, but incurvation is common. A slight traction of one to two kilos will correct this tendency.

Fractures of both bones demand more care. Here traction of three to four kilos is necessary.

Traction may be made by a gaiter made of two layers of unbleached muslin lacing across the instep and provided at each side with a tape to fit the buckle of the spreader. Or bands may be glued to the side of the leg, or Finochetto's band may be employed.

REVIEWS.

A Text-book of the Practice of Medicine. By James M. Anders, M.D., Ph.D., LL.D. Thirteenth Edition, Revised with the Assistance of John H. Musser, Jr., B.S., M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1917. Price $6.00.

When thirteen editions of a book appear in twenty-one years there is little left for the reviewer to do except to call attention to the fact that the volume continues to be well received by the profession, the more so when there have been a number of reprintings which have not been called editions. A very large number of medical men must possess at least one copy of one edition, and, therefore, the profession in large part is familiar with the character of the text.

In the preface of the 13th edition Dr. Anders states that he has called to his assistance Dr. John H. Musser, Jr., in the revision of most of the text, and that the section on "Nervous Diseases" has been practically rewritten by Dr. Charles S. Potts.

The volume covers more than twelve hundred and fifty pages, including the index, and, therefore, is an exhaustive reference book upon the subject of which it treats, containing colored plates and black-and-white illustrations. It also contains a very considerable number of prescriptions illustrative of the treatment which is recommended. The worst illustration in the volume is the twelfth figure, which is so

intensely diagrammatic that it is neither true from the anatomical standpoint nor does it well represent the bronchopneumonia which it is supposed to picture. The colored plates are excellent. In the new edition special reference is paid to so-called "specific therapy" in typhoid fever and tuberculosis, the bacteriology of whooping-cough, and new matter has been added upon the treatment of tetanus, acidosis, and a number of other conditions. To use the words of the preface: "In the main, however, the same systematic and, it is believed, convenient arrangement of the subject matter has been followed in this as in previous editions."

DISEASES OF THE HEART AND BLOOD-VESSELS. By Thomas E. Satterthwaite, A.B., M.D., LL.D., Sc.D. Lemcke & Buechner, New York, 1918.

The author tells us that in the present volume he has regrouped and revised the more important topics of his "Diseases of the Heart and Aorta," issued in 1905, and his "Cardiovascular Diseases" of 1913. He has paid especial attention to blood-pressures, polygrams and their comparative values, the venous pulse, congenital cardiac affections, the relations of internal secretions to the heart, of circulatory disorders to epilepsy, the hygienic and dietetic management of heart diseases and their treatment by drugs. A chapter upon cardiac surgery by Dr. Babcock of Philadelphia has been added. On the other hand the topics of sphygmomanometers and sphygmomanometry, myocardial diseases in general, the frequent and infrequent pulses, cardiovascular thromboses, and special matters relating to the anatomy and physiology of the heart, as well as questions concerning its mobility and malposition, have been omitted, as has also the treatment of cardiac diseases by the Nauheim method. Descriptions of about one hundred cases which were used in the first volume have also been left out. A number of the chapters are practically reprints of articles which he has contributed to different medical journals. A considerable amount of statistical information as to the relative frequency of different lesions of the heart is given both as to the author's own experience and that of others. These statistics show the necessity of a very large number of cases if anything like the truth is to be attained. It is generally considered that mitral lesions are more common than aortic ones, and that mitral insufficiency is the most frequent of all vascular lesions, but, basing his figures upon his personal cases, the author states that aortic insufficiency occurred 49, aortic obstruction 39, and mitral insufficiency only 38 times.

The illustrations are, in great part, taken from other authors.

Possibly the general reader will consider that he gains the information which is the most useful to him in daily practice from the chapter on the drug therapy of the heart and blood-vessels, in which a large amount of information is given as to the various preparations which are derived from digitalis, and the value of such remedies as pituitrin and the educts of strophanthus are debated.

The book might be considered as being more of an expression of the author's personal views than as a statement of general opinion. On the other hand, this description gives a false impression in that it would indicate that the author does not quote freely from current literature. Quite the contrary is the case, for many pages have a number of references to different authors writing in American and foreign journals. Possibly the best title which could have been given the book would have been "What I Have Learned from Medical Literature and Personal Experience in Regard to Diseases of the Heart and Blood-vessels."

SURGICAL AND GYNECOLOGICAL NURSING. By Edward Mason Parker, M.D., F.A.C.S., and Scott Dudley Breckinridge, M.D., F.A.C.S. Illustrated. J. B. Lippincott Company, Philadelphia and London, 1916.

The effort of the authors has been to prepare a text-book which will supply the needs of the lecturer and operator without neglecting that part of the field which has already been successfully covered. More

than usual space has been devoted to the discussion and illustration of instruments, this being regarded as an important part of the nurse's education.

Part I is devoted to the Cells of the Body and the Invading Cells, the Sources and Modes of Infection and Infection in Wounds.

Part II discusses the field of Surgery, beginning with Pathology, and including the various specialties.

Part III deals with what is called the Minor Technic in Surgical Nursing, including: Postures, Bandaging, Preparations for the Treatment of Fractures; Remedial Measures, under which are included measures requiring simple cleanliness, special forms of dressings, aseptic technique; Fractional Doses in Hypodermic Medication; Weights, Measures, Solutions, and Formulæ; Charts and Records.

Part IV is devoted to the direct care of the patient. Instructions are given for observation of significant danger symptoms regarding measures to be taken and also for the comfort and well-being of the patient, and the routine nursing in operative cases is minutely described as well as the Postoperative Complications. The final chapter of this part is devoted to Dr. Crile's technique of Anoci-association or the preparation of the patient's emotions before the ordeal of an operation.

Part V is devoted to The Operation; the Operating Room, its Outfit and Supplies; Operating Material; Surgical Instruments; Aseptic Technic; Preparation for an Operation and the Operating-room Personnel; Selection of Instruments; Operative Steps; and finally, Operations in Private Houses are considered in the most satisfactory detail.

Part V includes also certain supplementary chapters: one devoted to the Gynecological Dispensary; one to Emergencies; one to the present attitude of the nurse; and a final one to an epitome of surgical and gynecological conditions.

This is a serviceable book for the nurse or teacher. It will be noted that under the caption of a Fracture Bed it is stated that the first requisite for a fracture of the hip, thigh, or leg is a rigid flat surface for the patient to lie on. No such fracture can be treated properly on a bed that sags. This condition is probably fulfilled in but very few hospitals, although in the main it is fundamentally and essentially true.

The authors aptly remark that the passing of a colon tube beyond the sacrum frequently requires considerable patience and ingenuity of manipulation. As a matter of fact it cannot be passed beyond this point by any manipulation or by patience which lasts a lifetime. It might have been well to mention the circumstance that a soft-rubber tube should always be used for enemas, and furthermore it is not gratifying to find that eggs and milk are advised as satisfactory nutritive enemas.

MILITARY SURGERY. By Dunlap Pearce Penhallow, S.B., M.D. (Harv.). With Introduction by Sir Alfred Keogh, K.C.B. Second Edition. Henry Frowde, Oxford University Press, London, 1918.

The second edition of Penhallow's book, following so shortly the first, has enabled the author to keep pace with the progress of military surgery, which he has most excellently done and has rendered available to the profession that information too widely spread through current literature to reach in systematic form the busy practitioner. The first chapter is devoted to the consideration of Projectiles and Other Methods of Inflicting Wounds, including Flame Projectors, Steel Darts and Bayonets. Among the Hand Grenades the Mills bomb, which is described and illustrated, is regarded as the most effective.

Shock is very briefly disposed of, as is infection. In the therapeutic or curative treatment of tetanus from 50,000 to 100,000 units are advised by subcutaneous, intramuscular, intravenous and intrathecal routes. The Dakin-Carrell treatment is fully described and given first place as an efficient means both of preventing and of combating sepsis. Foreign bodies, wounds of joints, wounds of bones are described

and illustrated at length, the author exhibiting a preference for somewhat complicated splints and dressings. Thereafter follow chapters devoted to Wounds of Blood-vessels, Orthopedics in the Base Hospital, Shell Shock, Gas Poisoning, and Trench Foot. An excellent book, giving a general view of the subject rather than minute and detailed instruction in any one branch, if perhaps the Carrell-Dakin technique be excepted.

LABORATORY METHODS OF THE UNITED STATES ARMY. Medical War Manual No. 6. Lea & Febiger, Philadelphia and New York, 1918.

This manual is designed to establish as far as possible uniformity of procedure in the Army Laboratories in those phases of work wherein standard methods can be described. The chief purpose is to furnish the experienced officer with a standard of comparison and to give the less experienced a guide over the difficult places. The responsibilities of the laboratory are pointed out in a few paragraphs, and some admirable general rules for the conduct of these laboratories are laid down, the last of which is that it is as important to keep accurate records as to carry on accurate tests.

The types of examination for which the laboratory staff must be prepared include bacteriological examinations of water for supervision of camp water-supply; similar milk and food examinations; clinical diagnostic bacteriology for ward services; diphtheria, diagnosis, and Schick reactions; pneumococcus type determinations; meningococcus, diagnosis, and carrier examinations; typhoid, paratyphoid, and dysentery, stool and urine examinations both of patients and for carrier detection; serological tests; agglutinations for diagnostic and differential purposes; Wassermann reactions and other complement fixations; clinical pathological tests which cannot be done by clinical staffs; autopsies and histopathology.

This manual has covered the subject in some 256 pages with a clarity, precision, and completeness which cannot be excelled. It is a book educational for every practitioner of medicine, carrying a direct and daily help to the laboratory worker and to the clinician who has learned how largely he can be helped by such a worker.

SCOPOLAMINE-MORPHINE SEMINARCOSIS DURING LABOR. By William Osborne Greenwood, M.D. (Leeds), B.S. (Lond.). Oxford University Press, Henry Frowde, London, 1918. Price $2.

After chapters devoted to the History, Chemistry, Action and Objects of the Treatment, the Technique is given in some detail, according to three groups of investigators, namely: the one-dose school, the standardized dosage school, and the individualization school.

Thereafter follow chapters devoted to the Effects on the Mother; Effects on the Infant; and finally the Results Obtained. Explicit and important directions regarding the maintenance of special charts, and some speculations upon the probable effect upon the birth-rate are contained in the concluding chapters, followed by a note upon the value of scop-omnopon, omnopon being stated to be the preparation known as pantopon and containing the double alkaloids of opium in the water-soluble form of their hydrochlorides, but free from their inert and injurious extractive matter. This can be given hypodermically and acts more quickly than does opium in its ordinary oral method of administration.

The author states that the number of instances of slight oligopnea is somewhat higher in infants where the cases have been treated by scop-omnopon than in those treated with scopolamine-morphine. He does not believe that this implies any added risk, but he believes that hypalgesia is obtained more effectively and that amnesia is not so readily induced. The effect of the scop-omnopon seems to be somewhat more prolonged.

This is a rational discussion of the whole topic and one designed to so standardize methods of observation that a safe and lasting technique for individual application ultimately may be found.